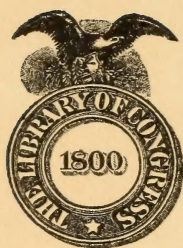


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DAVID HOSACK, M.D. F.R.S.

LECTURES

ON THE

THEORY AND PRACTICE OF PHYSIC,

DELIVERED IN THE COLLEGE OF PHYSICIANS AND SURGEONS OF THE
UNIVERSITY OF THE STATE OF NEW YORK.

BY THE LATE

DAVID HOSACK, M. D., LL. D., F. R. S.

PROFESSOR OF THE THEORY AND PRACTICE, ETC. AND OF CLINICAL MEDICINE IN THAT
INSTITUTION.

WITH AN INTRODUCTORY LETTER,

BY

NATHANIEL CHAPMAN, M.D.

PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE IN THE UNIVERSITY OF
PENNSYLVANIA, ETC.

EDITED BY HIS FRIEND AND FORMER PUPIL,

HENRY W. DUCACHET, D.D.

RECTOR OF ST. STEPHEN'S CHURCH, PHILADELPHIA.

PHILADELPHIA:

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TO NATHANIEL CHAPMAN, M. D.

*Professor of the Theory and Practice of Medicine, in the
University of Pennsylvania.*

DEAR DOCTOR,

I KNOW not any one to whom I can inscribe these Lectures with so much propriety as to yourself. My revered preceptor was your friend, and you were his. You have been engaged the greater part of your life in teaching the same branch of science which he so eloquently taught. And the profession have agreed in placing you both in the same rank with the eminent men who have been celebrated as the most able and successful of our medical teachers.

I pray you to accept this offering, as the sincere expression of my high appreciation of your talents, your eloquence, and your learning; and as the evidence of the personal regard and attachment of your friend and Pastor,

HENRY W. DUCACHET.

Philadelphia, October 9, 1838.

INTRODUCTORY LETTER.

MY DEAR SIR :

I have carefully read the copy of the Lectures of the late Professor Hosack, which you had the kindness to send to me. The high expectations I had formed of their merits, have been fully realised. They embody a very large mass of curious and useful information, clearly and agreeably conveyed. Excepting some pathological doctrines, I find little in them to which I would object. The practical part I consider sound, or at least, it corresponds very much with my own views. Long and extensively engaged in the profession, and with his acute and discriminating mind, he could scarcely fail to arrive at just conclusions in whatever regards the management of disease. He deserves, and will no doubt rank, among the most authoritative of our writers on the subject. You have done well in publishing the work. No effort shall I spare to promote its distribution; and I mean especially to recommend it to the attention of my class.

I have the honour to be, dear sir,

Very faithfully, your friend, &c.

N. CHAPMAN.

The REV. DR. DUCACHET.

Philadelphia, Oct. 10, 1838.

PREFACE

BY THE EDITOR.

IT was my privilege in early life to become the private pupil of the late Dr. Hosack. The attachment he conceived for me during the years I enjoyed the happiness of his professional instructions, continued uninterrupted ever after; and I possessed the honour of his friendship till he died. On the death of my beloved preceptor and friend, all his papers, agreeably to his directions before his decease, were delivered into my hands. I found them, indeed, an immense collection. Among them were manuscript notes upon almost every subject, and particularly upon his favourite science; and courses of lectures upon almost every branch of medicine, for he had taught them all, and had held successively nearly every professorship in the college.

Dr. Hosack had been a student all his life; he had corresponded for years with almost every celebrated literary and scientific character in America and Europe; he had practised physic forty years, and seen in that long practice as many patients perhaps as any other physician in this country ever did; he had held a high rank among the most distinguished of the profession; and had been pronounced by the public voice to be worthy of being ranked as a teacher of medicine, with such men as Rush, and Wistar, and Physic, and Chapman. He was, therefore, no ordi-

nary man. Abroad, as well as at home, he was regarded and honoured as one of the very first physicians of the age, both as a man of varied and profound professional attainments, and of great practical skill. I was sure that in such a collection of papers, made by such a man, there must be much that was valuable; and something that would benefit the medical profession. But it was impossible for me, withdrawn as I am from medical pursuits, and immersed as I am in the labours of an extensive and responsible parochial city charge, to undertake the task of examining them all, and judging of their worth. I knew, however, his reputation as a lecturer on the theory and practice of physic. I recollected well with what eloquence, with what clearness, with what admirable sagacity, he used to teach that branch while I was at the University; and I knew that his celebrity in that department suffered no diminution during the subsequent period he continued his labours there. I came to the determination, therefore, to select his lectures on *that* subject for the press. I thought that, even if the lectures embodied in this volume were of inferior value, the public at large, and the profession especially, would be gratified to know how medicine was taught by so celebrated and experienced a teacher. From them they will derive some idea of his method, his style, and his system. It is true, as they appear, excellent as they are, they do not full justice to his merits. The reader has not his frequent and oftentimes eloquent extempore illustrations; the numerous cases he used to adduce to fortify his principles and exemplify his practice; the constantly recurring anecdotes which gave so much interest and charm to his lectures, and served so well to keep up and enliven the attention of the audience; and, worst of all, most of his beautiful classical allusions, and of his learned references and quotations, are lost. All these were so familiar to him, that they were seldom written.

The manuscripts would perhaps contain a memorandum here and there that would remind one who had often heard him, of the many striking and learned illustrations he was in the habit of adducing—but could not enable the editor entirely to recover them, or to give them with any thing like tolerable accuracy. And then, the *manner* could not be represented. The vivid flashes of his keen eye; his fine, manly, commanding voice; his animation of delivery, rising, as it often did, to enthusiasm; and his graceful, powerful gesticulation—all these are gone. No reader can imagine them. He must have heard, and have seen the man, to understand what he was in his lecture room. Certainly, if he had adopted St. Augustine's rule for preaching, as a rule for his prelections, he could not have come nearer the venerable father's standard of perfection. There was in his style or his manner nothing that appeared like the "*obtusè, deformiter, frigidè;*"—but every thing was done and said, "*acuté, ornaté, vehementer.*"—AUGUSTIN. *de Doct. Christ. lib. 4. cap. 5.*

But I make no farther apologies for the work, or for myself. I commit it to the judgment of the profession, with the confidence that, whatever may be their decision as to its merits, all must acknowledge, or if any refuse to acknowledge, they must know, that few, if any, courses of lectures on the theory and practice of physic, have been more clear, more learned, more practical, or more exactly adapted to the purposes of such a course, than these.

The intelligent reader cannot fail to discover that Dr. Hosack was considerably in advance of his own times. He lived to have the satisfaction of seeing many of the views and principles for which he had contended almost single-handed, adopted exten-

sively in Europe and his native country; and, had he lived a few years more, his triumph, I have no doubt, would have been greater still. The present volume contains, it will be perceived, only his lectures on fevers and the phlegmasiæ. These made the principal part of the course. Whether the remainder will hereafter be published, must depend upon circumstances which cannot at present be foreseen or controlled.

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LECTURE I.

ON THE CLASSIFICATION OF DISEASES.

THE immediate object of the course of lectures upon which we are now to enter, is the exhibition of the nature, causes, and cure of diseases. But when we look at the multitude of diseases to which the human frame is liable, where shall we begin—what shall be our order of proceeding? Let us in the first place endeavour to arrange into some order the numerous objects which are to come before us. This is the business of *nosology*.*

Nosology may be defined to be an arrangement of diseases, in such order as will be best calculated to give us a knowledge of them, and of the most prominent characteristics by which they are to be distinguished from each other.

Where many objects are presented to our notice, you will readily admit some order becomes necessary to a correct view of them; and especially to enable the mind to retain the impression of them. In natural history the objects are so numerous that the memory could not possibly contain them without the aid of a system, or some methodical arrangement; especially the numerous objects of the vegetable kingdom. There are now upwards of thirty thousand species of plants well described by botanists, and distinguished from each other. But without some classification of those objects, what memory could retain them?—They must be associated, to be remembered.

* Nosology is a term composed of two Greek words—*νoσος*, which signifies disease, and *λογος*, discourse.

In the animal or the mineral kingdoms, the objects are not so numerous: nevertheless arrangement in those departments of natural science is no less useful and necessary in acquiring a knowledge of the various objects they embrace. In a word, no art or science, where the objects of which it treats are numerous, can be acquired without it: for none can be clearly treated of or communicated without arrangement.

In describing diseases, a somewhat similar or analogous mode of arrangement has been adopted, and has been formed upon the resemblances and distinctions which are found to exist between them. This mode of arranging diseases was first suggested (at least practically suggested) by Sydenham and Baglivi. They were the first who proposed the distribution of diseases upon similar principles with those afterwards adopted by botanists—into classes, orders, genera, and species; and they were the first who connected with them characteristic definitions, in which are detailed the distinctive or pathognomonic symptoms of each individual form of disease.

I may here remark that various other modes of arrangement have been adopted, and have had their abettors; but they have all given place to that which is now most generally pursued as founded upon the distinctive symptoms of diseases.

Aretæus and Cœlius Aurelianus divided diseases according to their duration, into acute and chronic.

Johnston, Sennertus, and Morgagni, and I may add Dr. Mead in his "Medical Precepts and Cautions," distribute diseases according to their seat—into those of the head, chest, belly, limbs, &c.; making the anatomical division of the body the basis of their arrangement. Indeed the late physiological system of Dr. Good is founded upon this principle; and the same is adopted by Dr. Chapman, in the school of Pennsylvania.

Boerhaave, Riverius, and Hoffman, again, adopted a different principle of arrangement. They divided diseases according to the supposed causes from which they were produced. This system of arrangement has been denominated the *Ætiological* arrangement, from the term *αἰτία*, signifying a cause.

But all these several methods have yielded to that now generally in use, founded upon the pathognomonic symptoms, and which, as most true to itself, is now considered as the most wor-

thy of attention. For, notwithstanding the influence which climate, constitution, temperaments, and peculiar frame of body, may have in varying or modifying the character of diseases, the great features or leading symptoms by which any individual disease is attended, are so constant and strongly marked, that they furnish us with the best possible basis of an arrangement by which diseases are to be distinguished and ascertained, and which is essentially necessary before we attempt to investigate their nature or their causes—or prescribe for their relief.

The hint suggested by Sydenham, was first realised by the learned Sauvages, the professor of botany and medicine, at Montpellier,—the Boerhaave of Languedoc, as he was sur-named, such was his learning and so extended his reputation. Sauvages first published the outlines of his plan in 1731, in a little modest duodecimo volume, under the title of “*Nouvelles Classes de Maladies*,” but not until he had submitted his intention to the judgment of Boerhaave. In this edition, he only descended to the genera. In 1763, four years before his death, he published a new and more extensive edition in five volumes octavo, embracing the species of diseases. This second edition may be considered as the first in reality; and upon it he had patiently laboured upwards of thirty years. So important was the subject of nosological arrangement in the opinion of the great and learned Sauvages.

But his last and still more complete edition, which he had prepared with the utmost care, he did not live to publish. It appeared in 1768, the year after his death, in two volumes quarto. He died 19th February, 1767, aged sixty-one. A methodical arrangement of diseases was next followed by Linnæus in 1763. A pupil of Linnæus had published an outline of his method in 1759. Afterwards succeeded Vogel, the professor at Gottingen.

In 1764, Vogel published a close approximation to the work of Sauvages, but containing much personal observation of the phenomena of diseases. His work is entitled “*Definitiones Generum Morborum*.” This appeared at Gottingen in 1764, in a single octavo volume. These were followed by the “*Systema Morborum Symptomaticum*” of Sagar, the professor at Vienna, published in 1776, which is another modifi-

cation of the system of Sauvages. Dr. M'Bride also, has left an imperfect arrangement of diseases, which, on account of the skill he has displayed in the arrangement of his genera and species, deserves the attention of the nosologist.

Lastly appeared, the *Nosologia Methodica* of Dr. Cullen, whose classification has been considered as the most perfect of any systematic arrangement that has yet been published.

I pass over altogether, the visionary views of Brown and Darwin, on this subject.

In 1731, Sauvages, as I before remarked, first attempted his system of arrangement, but he did not give it publicity, until he had matured it during thirty years' observation. It is, accordingly, the best that appeared prior to that of Dr. Cullen.

Sauvages divided diseases into ten classes, which comprehended upwards of forty orders, more than three hundred genera, and an innumerable host of species.

No wonder Monsieur De Rette exclaimed, "Quel nombre prodigieux d'ennemis." This number of species was diminished by Linnæus and Vogel, who succeeded him. The classification of Sauvages, notwithstanding the labour he bestowed upon it, is not free from several errors and imperfections. Some of these it possesses in common with all other attempts to arrange into classes the works of nature; for anomalies occur in diseases as in the objects of natural history, which disturb the unity of artificial arrangements, uniting dissimilar genera, and rendering necessary the separation of others which a general analogy would connect. Other imperfections, however, in the classification of Sauvages appear to be the result of a want of accurate attention or discrimination. It is true, that Felix Platerus, about the end of the sixteenth century, and the beginning of the seventeenth, (his work was published in 1602, under the title of *Praxis Medica*,) had made an attempt to arrange diseases upon the symptomatic plan, but it was so imperfectly executed as not to be considered as a system of nosology. Yet it is very possible that Sydenham availed himself of it—he was at least actuated by the same quickening spirit, for his various treatises and epistles, are a practical comment upon Plater's principle: and it is probable too, that Sauvages took some hints from it, imperfect as it was. They are, however, few and but of little importance.

Mr. Good considers Platerus, as “the morning star that first glimmered in the hemisphere of symptomatology, as Servetus was in that of the circulation of the blood. The light of both,” he adds, “was feeble and tremulous, but it twinkled in the midst of darkness and led on to the brightness of day.”

But to Sydenham, in my opinion, Sauvages was most indebted for the full illustration of that symptomatic method which constituted the great improvement that this subject has received at his hands, and which has been matured by his successors—particularly by Dr. Cullen.

Linnæus of Upsal, the great botanist, and who had been much occupied in devising arrangements of the vegetable kingdom—his favourite department of science, and Vogel of Göttingen, as I said, gave the world two other systems; but they followed that of Sauvages so closely, that medicine has received but little benefit from their labours. Indeed, in the opinion of Dr. Cullen, both Linnæus and Vogel have embarrassed nosology—the former by the introduction of terms that are unnecessary—the latter by those which are actually frivolous and improper.

In the year 1817, another system appeared which, although rejected by the College of Physicians, attracted much notice from the learned in Great Britain. It is the physiological system of that distinguished scholar and surgeon, Dr. Good of London. He calls it a physiological system, thereby denoting that it is founded upon a physiological view of the diseases it describes.

So far as our purpose is concerned, it is liable to two prominent objections.

1. Diseases of the same nature as it regards their general character, are treated of in each and every class, merely because they happen to be seated in different parts of the body.

2. His terminology is new.—This is not wanted. The truth is, he is a better scholar than physician.

All nosological arrangement has been objected to by some physicians. But the abuse of it is certainly no argument against its use.

The great objection that has been generally alleged against nosology is, that each systematic has been guided by his own theoretical or rather hypothetical notions. Medical science

has certainly been injured in this respect, in all ages, by the undue application of the predominant and fashionable sciences to explain the laws of the animal economy. It has been injured even by the exact sciences, mathematics and mechanics, which were applied to explain the functions of the body, after Sir Isaac Newton had rendered those branches of study popular in the world, by the numerous improvements he introduced into them.

While the mechanicians (as in the examples of Pitcairn and Keill,) calculated the force of the stomach in the digestion of the food, or the power of the heart and arteries in circulating the blood—while they measured the momentum of the fluids, together with the shape and dimensions of the tubes they move in, as if belonging to an hydraulic machine—and while the chemists in like manner, examined the change of properties those fluids acquire by such motion through the body, and undertook to explain secretion and excretion by their art, they forgot that the vital principle also, controls and governs all the phenomena of the living body, and that animation is the predominant power in our system.

Metaphysics have also been applied in the same exclusive manner in accounting for the phenomena which our bodies exhibit, both in the healthy and the morbid state. Hence, the *anima medica* of Stahl, and the errors it has introduced. Chemistry in like manner has injured medicine, by the undue extension of the discoveries of Dr. Black, Priestley, and Lavoisier, in explaining the phenomena of diseases. Even electricity was had recourse to by its ardent cultivators, to account for the phenomena of disease. According as the electric fluid predominated or was diminished in our system, whether plus or minus, so were the characters of its diseases. And these were to be removed by restoring the equilibrium. Shaw's system of medicine is exclusively founded on these principles. It is surprising to observe the inordinate attachment which parents manifest to these children of the imagination!—And it happens too that frequently, in proportion to the deformity with which they come into the world, will be the efforts made to perpetuate their existence.

As with the electrician, so it is with the mechanical philosopher, the mathematician, the metaphysician, and the chemist, in

the application of their doctrines to medicine. It is not intended to depreciate the utility of those departments of knowledge to the physician—their use and their application must be admitted by all—but, like the vires naturæ medicatrices, they should be the handmaids and not the mistresses of our science. They should follow, but never exclusively direct, our researches. While some eminent physicians in consequence of this abuse of the application of the different sciences to medicine, are disposed to decry nosological arrangement, let us not go to the other extreme, by rejecting it altogether.

The object of nosology is not merely to assemble diseases—it also furnishes the characteristic, or more prominent, symptoms by which diseases are designated: and thence we are led readily to distinguish them one from the other.

But we are not only by such arrangement, led to the knowledge of the pathognomonic symptoms of each family or genus—our inquiries immediately extend to the species or members of each family, and even the varieties it exhibits under particular circumstances. This is not all—knowing the peculiar character of diseases, we are equally induced to ascertain and to discriminate between the various remote causes from which those diseases severally proceed; and thence we ascend to a knowledge of the more immediate or proximate cause—our great guide in the cure, inasmuch as such assemblages of diseases lead to general principles in practice. We may say, therefore, of diseases as of style or painting, according to Ovid's description of the twin sisters,

“Facies non omnibus una, nec diversa tamen.”

They are not all the same—yet they are not so widely different, but that they have some common principles by which they are connected. Yet, according to circumstances they differ in their grade, or, perhaps, in their specific character; and thence demand each its peculiar treatment. We see this illustrated in croup. This disease, and very lately too, was considered by some as a malignant species of cynanche forbidding the lancet. See Dr. Bard's dissertation. See also, Fothergill, Douglas of Boston, and Johnston of Worcester, who have all treated of the malignant ulcerous sore-throat, which

frequently exhibited in its termination the symptoms of croup. Dr. Cullen understood it, and has given Dr. Bard's work on croup, its proper place in his nosological arrangement. He considered it as in reality not a primary croup, but in its commencement the malignant ulcerous sore-throat, which ended in croup. In the treatment, therefore, they were governed by its primary character, and the cause from whence it originated.

Again, by others, it has been considered as a spasmodic disease; but since that period it has been satisfactorily shown, that its spasmodic symptoms arise from the sensibility of the part in which the inflammation takes place. Accordingly, the disease, with all the various characters which it assumes, is now well understood. We know its symptoms, causes, species, whether idiopathic or symptomatic; and thence the general principles of treatment become apparent. So of hysteritis. There are two species; one purely inflammatory, the other symptomatic of a typhoid state of body—each calling for its peculiar treatment.

So of pneumonic inflammation. The pathognomonic symptoms are "fever, pain in some part of the chest, dyspnoea and cough." These combined, constitute pleurisy, and call for active depletion, venesection, &c. Again; take away the cough and fever, and you have a rheumatic affection of the muscles of the ribs. Venesection now, in some instances, is contraindicated and even injurious.—Or take away the pain—the cough may be symptomatic of other diseases, as typhus fever, indigestion, worms, &c., and the treatment must be directed accordingly.

If, then, it is important to distinguish diseases for the purposes of practice, it is no less necessary to class and arrange diseases for the purpose of knowing those distinctions as subservient to practice; and these, as Dr. Cullen has justly observed, can only be explained by a rightly constructed nosological method. And, in the language of Linnæus, "System is the Ariadnean thread, without which all is confusion."

Our countryman, Dr. Rush, objected to all nosological arrangement as injurious, yet he himself had his own unitarian system. He considered all the varieties of diseases, in whatever shape they may appear—in whatever part of the system they may be seated; whether in the solids or fluids, in the nerves,

the blood-vessels, or absorbents, as one and the same morbid action, viz. excitement, &c. To use his own language, "Disease is unit;" i. e. a modification of the same diseased action of the system.—Not only is his nosology thus limited, but his *materia medica* contains but one remedy; that is, that the remedies proper for those diseases are to be considered as having all the same general action upon the system.

Notwithstanding Dr. Rush's late attachment to this unitarian doctrine in medicine, he formerly was as warmly attached to the Cullenian arrangement. I remember the day when he recommended to his pupils, for I was at that time one of them, to commit even the definitions of Dr. Cullen to memory as he should do the rules of grammar in learning the Latin tongue, or the first axioms and propositions of Euclid in learning geometry. "Let me advise you," he then said to his pupils, "never to prescribe until you have investigated the disease and given it its proper place, its class, its order, its genus and species."

I hope I have profited by his instruction, and that I shall be permitted to adhere to his first lessons as more correct than his last doctrines on this subject: but let us recollect that even his unitarian doctrine of diseases calls for, and he has accordingly made, subdivisions denoting the various grades, forms and seats of diseases, or in other words, denoting the peculiar characters of individual diseases, and their associations arising out of those peculiar characters. He himself admits, "that in applying the principles of physiology, pathology and therapeutics to the practice of physic, some order is necessary in speaking of individual diseases." Indeed, we may say of the physician what Dr. Rush says of a philosopher, that he can no more be formed by a fortuitous concourse of ideas than a world can be produced by a similar concourse of atoms.

As it is not my intention to go into a very minute history of each disease, but to confine myself to the characteristic or pathognomonic and diagnostic symptoms as essentially subservient to practice, I shall insist the more on those symptoms as they are detailed in such system of nosology, referring you for the more ample details to the best books on each subject.

For all controversial matter too, upon the rationale of the causes of disease, I shall refer you to books also—when you have gotten the facts, I shall refer you to Brown, Cullen and

Darwin for their several speculations. My object is to give you the facts I have been enabled to collect, either from books, my own observation, or other sources; and these I shall arrange in the best order I can devise, both as it regards your remembrance of them and the general principles to which they may give rise. The inductive system, as far as I am capable of distinguishing between truth and error, shall be strictly pursued upon every subject of which we shall treat; that is, I shall lay before you the facts that I believe to be well established; and you shall draw the conclusions to which they lead; or rather facts will draw their own conclusions: for as I have said before, facts, well assembled, constitute general truths or principles. This leads me to make some remarks on the arrangement of Dr. Cullen, which is now most generally received by the medical world.—As to the nutshell system of Brown, dividing diseases into sthenic and asthenic, like that of Thessalus of old, into strictum and laxum, I altogether reject it as unworthy of our notice for the purposes of practice.—Like the unitarian doctrine of Dr. Rush, it is saying little more than “that disease is disease.”

In the arrangement which I have adopted, you will find that I am neither unitarian nor methodist; but an eclectic, or universalist, if you please; and, like the eclectics of old, I shall take truth, at least what I believe to be truth, from all their systems, wheresoever I can find it. My motto shall be the language of Pliny: “Auctorem neminem unum sequar sed ut quemque verissimum in qua parte arbitrabor.”—*Plin. Hist. Nat. lib. iii.*

LECTURE II.

OBSERVATIONS AND CRITICISMS UPON DR. CULLEN'S CLASSIFICATION OF DISEASES, &c.

As I remarked yesterday, the same principles of arrangement that have been adopted by the naturalist, in the disposal of the numerous objects of natural history, have been made use of by physicians in the distribution of diseases. They are assembled into parcels or classes, according to some manifest or well known circumstances, in which the members of each class have a resemblance, or possess properties or characters in common. Each class is next arranged into subordinate divisions, in which each sub-division is designated by some marks peculiar to itself. Those divisions of the classes are called orders. Each order again is made up of families called genera, possessing characteristic marks by which every such genus is distinguished from its congeners. Each family or genus, again consists of members denominated species—each species being designated by some characteristic marks that separate it from its fellow members of the same family.

Let us now by this standard, examine Dr. Cullen's arrangement, which has been most approved. To understand what I shall say, you must have before you a synopsis of his system, which I present you accordingly.

DR. CULLEN'S SYSTEMATIC ARRANGEMENT OF DISEASES.

CLASS I.—PYREXIE.

ORD. I.—FEBRES.

§ 1. *Intermittentes.*

1. Tertianæ.
2. Quartanæ.
3. Quotidianæ.

§ 2. *Continuæ.*

4. Synocha.
5. Typhus.
6. Synochus.

ORD. II.—PHLEGMASÆ.

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| 7. Phlogosis. | 16. Hepatitis. |
| 8. Ophthalmia. | 17. Splenitis. |
| 9. Phrenitis. | 18. Nephritis. |
| 10. Cynanche. | 19. Cystitis. |
| 11. Pneumonia. | 20. Hysteritis. |
| 12. Carditis. | 21. Rheumatismus. |
| 13. Peritonitis. | 22. Odontalgia. |
| 14. Gastritis. | 23. Podagra. |
| 15. Enteritis. | 24. Arthropoosis. |

ORD. III.—EXANTHEMATA.

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| 25. Variola. | 30. Erysipelas. |
| 26. Varicella. | 31. Miliaria. |
| 27. Rubeola. | 32. Urticaria. |
| 28. Scarlatina. | 33. Pemphigus. |
| 29. Pestis. | 34. Aphtha. |

ORD. IV.—HÆMORRHAGIÆ.

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| 35. Epistaxis. | 37. Hemorrhoids. |
| 36. Hæmoptysis. | 38. Menorrhagia. |

ORD. V.—PROFLUVIA.

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| 39. Catarrhus. | 40. Dysentery. |
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CLASS II.—NEUROSES.

ORD. I.—COMATA.

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| 41. Apoplexia. | 42. Paralysis. |
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ORD. II.—ADYNAMIÆ.

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| 43. Syncope. | 45. Hypochondriasis. |
| 44. Dyspepsia. | 46. Chlorosis. |

ORD. III.—SPASMI.

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| 47. Tetanus. | 56. Pertussis. |
| 48. Trismus. | 57. Pyrosis. |
| 49. Convulsio. | 58. Colica. |
| 50. Chorea. | 59. Cholera. |
| 51. Raphania. | 60. Diarrhœa. |
| 52. Epilepsia. | 61. Diabetes. |
| 53. Palpitatio. | 62. Hysteria. |
| 54. Asthma. | 63. Hydrophobia. |
| 55. Dyspnœa. | |

ORD. IV.—VESANIÆ.

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| 64. Amentia. | 66. Mania. |
| 65. Melancholia. | 67. Oneirodynia. |

CLASS III.—CACHEXIÆ.

ORD. I.—MARCORES.

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| 68. Tabes. | 69. Atrophia. |
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ORD. II.—INTUMESCENTIÆ.

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| § 1. <i>Adiposæ.</i> | 76. Hydrorachitis. |
| 70. Polysarcia. | 77. Hydrothorax. |
| § 2. <i>Flatuosæ.</i> | 78. Ascites. |
| 71. Pneumatosis. | 79. Hydrometra. |
| 72. Tympanites. | 80. Hydrocele. |
| 73. Physometra. | § 4. <i>Solidæ.</i> |
| § 3. <i>Aquosæ.</i> | 81. Physconia. |
| 74. Anasarca. | 82. Rachitis. |
| 75. Hydrocephalus. | |

ORD. III.—IMPETIGINES.

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| 83. Scrofula. | 87. Lepra. |
| 84. Syphilis. | 88. Frambæsia. |
| 85. Scorbutus. | 89. Trichoma. |
| 86. Elephantiasis. | 90. Icterus. |

CLASS IV.—LOCALES.

ORD. I.—DYSÆSTHESIE.

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| 91. Caligo. | 96. Paracusis. |
| 92. Amaurosis. | 97. Anosmia. |
| 93. Dysopia. | 98. Agheustia. |
| 94. Pseudoblepsis. | 99. Anæsthesia. |
| 95. Dysecœa. | |

ORD. II.—DYSOREXIÆ.

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|--------------------------------|------------------------------------|
| § 1. <i>Appetitus Erronei.</i> | 105. Nostalgia. |
| 100. Bulimia. | |
| 101. Polydipsia. | § 2. <i>Appetitus deficientes.</i> |
| 102. Pica. | 106. Anorexia. |
| 103. Satyriasis. | 107. Adipsia. |
| 104. Nymphomania. | 108. Anaphrodisia. |

ORD. III.—DYSINESIÆ.

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| 109. Aphonia. | 113. Strabismus. |
| 110. Mutitas. | 114. Dysphagia. |
| 111. Paraphonia. | 115. Contractura. |
| 112. Psellismus. | |

ORD. IV.—APOCENOSSES.

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| 116. Profusio. | 119. Ptyalismus. |
| 117. Ephidrosis. | 120. Enuresis. |
| 118. Epiphora. | 121. Gonorrhœa. |

ORD. V.—EPISCHESES.

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|------------------|----------------------|
| 122. Obstipatio. | 125. Dyspermatismus. |
| 123. Ischuria. | 126. Amenorrhœa. |
| 124. Dysuria. | |

ORD. VI.—TUMORES.

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| 127. Aneurisma. | 134. Verruca. |
| 128. Varix. | 135. Clavus. |
| 129. Ecchymoma. | 136. Lupia. |
| 130. Scirrhus. | 137. Ganglion. |
| 131. Cancer. | 138. Hydatid. |
| 132. Bubo. | 139. Hydarthrus. |
| 133. Sarcoma. | 140. Exostosis. |

ORD. VII.—ECTOPIÆ.

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| 141. Hernia. | 143. Luxatio. |
| 142. Prolapsus. | |

ORD. VIII.—DIALYSES.

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| 144. Vulnus. | 148. Psora. |
| 145. Ulcus. | 149. Fractura. |
| 146. Herpes. | 150. Caries. |
| 147. Tinea. | |

He divides all diseases, you will perceive, into four classes, viz. 1. Pyrexia; 2. Neuroses; 3. Cachexia; and 4. Locales.

His first class, *Pyrexiaë*, is a bad class; and independently of the incorrectness of his definition of it, should be expunged. Under this head, you will observe, Dr. Cullen professes to include all diseases attended with fever or increased heat, as the term *pyrexiaë* imports, being derived from the Greek word *πυρ*, signifying fire.

In the first place I remark, then, this class is objectionable, as it includes the order *hæmorrhagiæ*, which are not necessarily, nor are they always or even generally, febrile diseases. On the contrary, they are frequently without fever, especially hæmorrhage from the uterus, the liver, lungs, bowels, hæmorrhoids, and the hæmorrhage in scurvy. Indeed, I scarcely know any case of hæmorrhage that is febrile, unless it may prove so in its effects: even then, fever is an accidental and not a necessary attendant.

2. It excludes other diseases that are acknowledged to be of a febrile character, which Dr. Cullen has distributed in his other classes.

Pertussis, 56, which is usually febrile, he has placed among the *Neuroses*.

Syphilis, dropsy, placed in *Cachexiæ*, are oftentimes febrile. So, too, are *obstipatio*, 122; *vulnus*, 144; *fractura*, 149; *hernia incarcerata*, 141; *hyarthrus*, 139—all which he makes *Locales*.

Observe, I do not object to the place assigned to these diseases; but as Dr. Cullen set out with the intention of assembling all febrile or pyrexious diseases in the same class, he should either have adhered to his original intention, or he should not have made a class of this extensive character, as he has done his *pyrexiaë*.

Again—3dly. This class is defective, it wants a number of inflammatory diseases—it wants *diaphragmitis*, a distinct species; *periostitis* also is wanting.

It wants *phlegmasia dolens*, *otitis*, *odontitis*, *mastitis*. Indeed, it might almost be said that this class of *Pyrexiaë* is so general, that almost every disease might be included in it. For scarcely a disease exists that is not sometimes attended with fever. The class *pyrexiaë* is, therefore, too general to stand as a class.

The second class, *Neuroses*, is a good class and should have

a place in every system of arrangement; but constructed as it is by Dr. Cullen, it is exceptionable.

The first objection to it is, that it contains some diseases in which the blood-vessels and secretions are manifestly affected, and in which the nervous system is not primarily affected, viz. pertussis, 56. This disease comes on like a common catarrh—is a febrile disease, and properly one of the Pyrexia.

2dly. This class contains some diseases which chiefly consist of increased natural evacuations; as, cholera, 59; diarrhoea, 60; diabetes, 61. These are every thing else but Neuroses, and belong to a totally different class of diseases, not at all provided for by Dr. Cullen.

These diseases should not be placed in the class Neuroses, because of a particular symptom—otherwise every disease might be included in this class; for every disease exhibits some affection of the nervous system.

Nor should they be placed in Dr. Cullen's order of profluvia; because these diseases are generally without fever; whereas his profluvia have fever, and are in his class of pyrexious diseases.

3dly. Dr. Cullen's Neuroses contains some diseases as genera and species, which are only symptoms of other diseases.

Chlorosis, 46, is symptomatic of amenorrhoea or suppression of the menses, or a species of dyspepsia, but not an idiopathic disease.

Pyrosis, 57, is only a modification of indigestion, one of the symptoms of dyspepsia, but not a disease in itself. And dyspnoea, 55, is in like manner symptomatic of catarrh, pneumonia, hydrothorax, an excessive quantity of fat, angina pectoris, and other affections of the chest, but is not an idiopathic disease; and therefore should be expunged. Indeed, it should have no place in any system, as it is only a symptom, and not itself a disease.

4thly. This class is defective, as it does not contain many diseases which are exclusively nervous, and are arranged in the other classes,—such as amaurosis, 92, of the first order of locales, and the other paralyses of the senses, as 96, 97, 98, &c. paracusis, anosmia, agheustia, aphonia, 109.

5thly. It does not contain all the diseases of the mind—as

nostalgia, 105, which is a species or a peculiar form of melancholia. See second order of class Locales, where it is most strangely located.

6thly. The class Neuroses does not contain the affections of the stomach, connected with dyspepsia, 44, as the dysorexiæ, thrown into the second order of class Locales, in which he separates bulimia, 100; pica, 102; anorexia, 106; from dyspepsia, of which they are modifications or symptoms, and with which, therefore, they should be associated.

The third class, Cachexiæ—meaning diseases of a bad habit of body. This class, as its name imports, ought to include all diseases which arise from a vitiated or bad habit of body. Does it do so? No—it does not; it is defective.

1. It does not contain among his intumescentiæ or swellings, all the dropsical diseases, as hydrops pericardii, hydrops ovarii, hydrops articuli.

2. It wants mollities ossium; fragilitas ossium; lithiasis or calculus; the yaws, or frambæsia; and the form of syphilis denominated laanda Africana, as described by Dr. Winterbottom.

3. This class is not only defective—it is faulty. It contains some eruptive diseases, as in the third order, impetigines, as, elephantiasis, 86; lepra, 87; frambæsia, 88; while other eruptive diseases are dispersed in other classes, some in the first class among the exanthemata, as small-pox. Others again are in the fourth class Locales, viz. tinea, 147; herpes, 146; psora, 148; and which are not always local or confined to a part.

These eruptive diseases should all be associated in one class, in order that a comparative view may be taken of them, and that some general principles may be derived from such association, and thereby lead to some general results as to their treatment.

4. The order impetigines contains diseases which are without eruptions, yet they are placed here under the head of scabby or eruptive diseases, as the term impetigines imports, viz. scrofula, 83, which is not eruptive; syphilis, 84, which is not invariably so; icterus, 90, which is a suppression or retention of bile, in which there is no eruption, but only a yellowness of skin. This surely is not sufficient to justify its

place here; if it is, then yellow fever, and bilious remittent, and hepatitis, should be here too.

Class 4—Locales. In this class too, we shall find a very objectionable arrangement.

1. It contains in the first and third orders, several of the paralyses, (viz. in the first order, amaurosis, 92; paracusis, 96; anosmia, 97; agheusia, 98; anæsthesia, 99: and in the third order, aphonia, 109; mutitas, 110; dysphagia, 114;) which, though they are partial, yet are of the same nature and character with the general palsies, and should be arranged with them among the Neuroses, especially too, as they call for the same general principles of treatment.

2. It contains nostalgia, 105, which is a disease of the mind and manifestly belonging to the class Neuroses.—Upon what principle, then, can it be placed among the local diseases?

3. It contains many diseases which are of a general, not of a local nature, viz. obstipatio, 122; ischuria, 123; amenorrhœa, 126; which belong to a totally different class of diseases—the class of suppressiones, which have no distinct or appropriate place in Dr. Cullen's system. If these diseases or other suppressions of natural discharges have a place in the class Locales, upon the same principle all the phlegmasiæ have equal claims to this class.

4. The class Locales contains many diseases which should be constituted a different class, in which excessive discharges are brought together—another class, not provided for by Dr. Cullen—profluvia, viz. profusio, 116; this should be associated with hemorrhages; ephidrosis, 117; epiphora, 118; ptyalismus, 119; enuresis, 120. These being general, not local diseases, have no business here, but should belong to the class of Profluvia, or increased discharges.

5. It contains gonorrhœa virulenta, 121, and hydarthrus, 139, which belong to the inflammatory diseases, the phlegmasiæ—excepting gonorrhœa, properly so called—I mean increased seminal discharges, according to its etymology: that should be one of the profluvia.

6. It contains also eruptive diseases, viz. herpes, 146; tinea, 147; psora, 148, which should not be separated from the other eruptive or cutaneous diseases. He even, as before remarked, separates them from lepra, and other eruptive diseases in the

third class, as well as from urticaria, of the first class, but which should all be associated in one class of cutaneous diseases.

7. It contains contractura, 115, as a distinct disease, which is either an original deformity, or is symptomatic of some previous injury. In like manner he has bubo, 132! This too, is a mere symptom—it is symptomatic of syphilis, of pestis, scrofula, phlogosis.

8. It contains many diseases which belong to dyspepsia, being symptomatic of it, or so nearly allied, that they should at least be associated with it in the same class, and not among the Locales. See second order of Locales, viz. bulimia, 100; pica, 102; anorexia, 106; adipsia, 107; polydipsia, 101.

9. This class is defective, it wants several genera, viz. bronchocele, fungus hæmatodes, polypus of the nose and throat.

I shall now proceed to make a few remarks upon the subordinate arrangements of Dr. Cullen's classification.

(1.) I observe that he has no remittents in his first order—confining himself entirely to the intermittent and combined forms of fever—whereas remittents, especially in warm climates, are certainly altogether distinct from intermittents in their character, and require a totally different treatment. They therefore should have an appropriate place in a system of practical nosology. In this country this distinction is essentially important.

2. Dr. Cullen too, as you will perceive in his section called continued fevers, distinguishes typhus from synochus, making them two distinct genera!—yet in his notes he acknowledges he cannot distinguish between them. “*Inter typhum tamen et synochum limites accuratos ponere non possum; et an revera pro diversis generibus habenda vel positis diversis, utri eorum synonyma auctorum referenda sunt, dubito.*”

3. Dr. Cullen's febres do not embrace the plague, 29, one of the most formidable febrile diseases that man can be afflicted with. This, Dr. Cullen has very improperly placed among his eruptive diseases, in the third order, 29! merely because of the petechiæ sometimes attendant upon it. He should for the same reason place typhus in the same order with plague.

4. Nor does this order, febres, contain another violent and

dangerous form of fever, dysentery, which holds a very improper place among his profluvia ! for it is every thing else but profluvia.

(2.) The second order, phlegmasiæ, is no less defective. As I have already observed, it wants, first, several inflammatory diseases, and which indeed are wanting altogether in his system of arrangement. It wants otitis, odontitis, mastitis, auritis, phlegmasia dolens, periostitis.

1. In this order Dr. Cullen should also have included many diseases which he has elsewhere distributed. This order should have contained, first, catarrhus, 39, which is placed in his fifth order, profluvia.

2. Phthisis pulmonalis, embraced under the head of hæmoptysis, 36 !!

3. Urethritis—see Locales, order 4, 121 !

4. Hydarthrus, 139, Locales, order 6, tumores.

Phlogosis, the first of his phlegmasiæ, might for the same reason as a tumour have been here among the Locales.

(3.) Dr. Cullen's third order, exanthemata, is no less incorrect and incomplete.

1. It is incorrect inasmuch as it contains pestis, 29, which is not an eruptive disease any more than any other form of fever. And he himself expresses the doubt whether pestis should not be placed among the fevers. As I have no doubt on this subject, I have placed it among the fevers, in the arrangement I have offered for your consideration.

2. This order is incomplete, as other eruptive diseases are omitted, and placed among other classes—viz. some in his third class, order 3. Impetigines; and others in his fourth class, eighth order, as dialysis and herpes, &c.

(4.) His hæmorrhagiæ, order 4, are imperfect—besides the error of placing it among the Pyrexia, this order wants

1. Hæmatemesis—2, hæmaturia, and 3, hepatirrhœa, a discharge of blood from the liver as in disease of that organ—as occurring, occasionally, in typhus fever, but most frequently attendant on yellow fever. In the latter disease indeed few die without that symptom; hence the yellow fever is commonly called by the Spaniards, vomito prieto; but in other febrile diseases it is only an occasional occurrence, and then fre-

quently is owing to preceding disease of the liver, and that too, most generally from intemperance.

(5.) His order, profluvia, is exceptionable—it has what does not belong to it, and wants all that strictly do belong to it.

It is incorrect as containing two diseases that have no claim to this place; on the contrary, catarrhus is properly one of the phlegmasiæ, and is constituted by a diminished discharge from the membrane, the seat of disease. So with dysentery, its companion, in this order; it should be in the order of febres, for it too is constituted by diminished instead of increased discharges from the intestines. Thus you see that these are any thing else but profluvia!

This order of profluvia, too, is incomplete, inasmuch as it excludes many other diseases of the character here professed, as ephidrosis, 117; ephiphora, 118; ptyalismus, 119; cholera, 59; diarrhœa, 60; diabetes, 61; enuresis, 120; which are distributed in other parts of his system; and leucorrhœa, absurdly placed, too, among his hæmorrhages.

This order is also incomplete, by excluding altogether some other diseases, as otirrhœa, gelactirrhœa, and gonorrhœa—I mean strictly so, as its name imports, seminal weakness, from γονος, semen—not urethritis.

The subdivisions of his second class are no less exceptionable.

(1.) Comata, strictly speaking, is a bad order—*κομα* signifies a propensity to sleep. This is not the case with all the palsies, for paraplegia, when proceeding from injury of the spine, is not always attended with coma.

The partial palsies should also be here associated—whereas they are improperly placed among the Locales, first order!!

(2.) Adynamix is incorrect and incomplete—incorrect, as it contains a disease of the mind, hypochondriasis, a grade of mania, which therefore should be associated with the other diseases belonging to the vesaniæ, fourth order.

It contains, too, chlorosis, 46, which is symptomatic of amenorrhœa, and is no more than a species of dyspepsia. •

This order, too, is defective, as it separates dyspepsia from its congeners. Its opposite diseases are contained in the Locales, second order, viz. pyrosis, 57; bulimia, 100, &c.

It is defective, too, as it excludes altogether, asphyxia, which is not contained at all in his system, and anaphrodisia, 108, the loss of the venereal appetite and capacity. This is placed among the Locales without any regard to the general state of the system or the general remedies to be presented for its relief, for it is sometimes owing to the pressure on the brain by plethora.

(3.) His spasmi are incorrect and defective.

1. Incorrect, as they contain pertussis, 56, one of the phlegmasiæ; pyrosis, 57, not a spasmodic affection at all, but which is properly one of the adynamiæ, or rather a symptom of dyspepsia; colica, 58, which embraces many varieties or species of enteritis; cholera, 59; diarrhœa, 60; diabetes, 61; which are without spasm frequently, and belong to the profluvia.

2. It contains also dyspnœa, 55; a mere symptom, but of a great variety of diseases.

3. It wants a number of diseases, altogether omitted in his system; as tic douloureux, or neuralgia; tremor; angina pectoris; nephralgia; hysteralgia; hepatalgia.

This order of Dr. Cullen's, notwithstanding these omissions, appears to be "a common receptacle for the refuse of the whole nosology." This order stands ready to receive every disease that happens to be rejected from the other orders. Wilson may well ask where is the similarity between hydrophobia and diabetes? between colic and whooping-cough? between dyspnœa and epilepsy?

His fourth order, vesaniæ, wants hypochondriasis, 45, improperly placed among the adynamiæ.

Objections to the subdivisions of his third class—Cachexiæ. His first order, marcores, is somewhat questionable. This signifies leanness, emaciation—emaciation alone is not sufficient to form an order upon, being always symptomatic of other diseases, as of ulcer, phthisis, abscess, scrofula, poisons. Atrophia, 69, is not a distinct disease, but generally arises from bad food, old age, or is symptomatic of dyspepsia, as in dirt-eaters.

The second order, intumescentiæ, wants three dropsies, viz. of the pericardium, of the ovarium, and of the joints. This order also contains an improper genus, rachitis, one of those diseases analogous to syphilis, or those arising from a morbid condition

of the system—it is therefore properly one of the vitia, and should not be placed here on account of the tumour attending it.

The third order, the impetigines, is also exceptionable. It contains icterus, 90, which arises from a suppression of bile, and belongs to a distinct class of suppressiones, not provided for by Dr. Cullen. It also contains scrofula, which belongs to vitia, denoting the deranged state of the whole system, both solids and fluids; but neither of these should be placed among the impetigines or scabby diseases.

His impetigines, too, are superfluous, as it separates the cutaneous diseases from those in the third order of that class, and those of the eighth order of the fourth class.

Let us now look at his class Locales.

The first order, if we except caligo, 91, is superfluous—it is improper that anosmia should be in the first order, 97, and aphonia, in the third, 109.

The second order of the fourth class is altogether superfluous—the affections of the stomach, dysorexiæ, belong manifestly to the same place with dyspepsia, with the adynamia.

Satyriasis, 103; nymphomania, 104; anaphrodisia, 108, also belong to adynamia, i. e. debility of the natural functions.

Nostalgia, 105, is nearly allied to melancholia, one of the vesania, and is so arranged by Vogel, 65.

This disease, nostalgia, is a species of melancholy in which the predominant symptom is the unceasing and ardent desire to return home—of course it only occurs in those who are absent from their friends or their native country. It is so called from νοστέω, to return, and αλγος, dolor, pain, or grief—the *maladie du pays*, as the French call it. That Sauvages and Dr. Cullen should have given it this place is most extraordinary, as one would suppose that there was some particular organ in the body in which the amor patriæ resides, as hunger and thirst in the stomach. This disease is not confined to the Swiss, but in a peculiar manner affects the Swiss and the unhappy African, as well as the people of other countries, torn from their native land and the society of their friends and connexions.

3. The third order are all neuroses, all palsies, excepting contractura, which is symptomatic of wounds or other injuries, or should be placed among the deformitates.

4. The fourth order are all profluvia, not Locales, viz. ephidrosis.

5. The fifth order, are all general diseases, not local. They belong strictly to suppressiones or obstructions.

6. The sixth order, tumores, is incorrect, containing bubo, 132, which is generally symptomatic—hydarthrus, 139, of the phlegmasiæ. It is also imperfect; it wants bronchocele, fungus hæmatodes, polypus.

7. The ectopiæ are unexceptionable.

8. Dialyses. Ulcer and caries are synonymous, as caries is an ulcer of the bone. This order is also faulty, containing cutanei—and especially as these are not all local. Besides, it involves a gross absurdity to bring together diseases so perfectly incongruous as some of those embraced in this class; for what possible connexion or affinity, I ask, can be found between psora, the itch, and a broken bone? They stand next to each other as you perceive in Dr. Cullen's arrangement.

I shall now proceed to make a few remarks relative to the arrangement here adopted, and which I propose to observe in the prosecution of this course of lectures.

Adverting to the synoptical view which is prefixed to the plan proposed, you will perceive, in the first place, I have rejected the class Pyrexiaæ altogether, as too general.

It is difficult, upon many occasions, to make precise distinctions between diseases that are febrile and those without pyrexia. Many diseases are febrile upon some occasions, but not so on others. Many local diseases become febrile by the severity of pain or the continuance of the irritation, or by derangement of particular organs. Any cause that gives a great shock to the constitution is capable of producing general pyrexia, and vice versa. As local complaints often produce pyrexia, so on the other hand, pyrexia predisposes to, and produces local complaints—hence local complaints in typhus fever or abscesses. Pneumonia and rheumatism are oftentimes the produce of general inflammatory fever; and the disease changes its name. Dysentery and diarrhœa frequently produce fever, and fever, in some cases, produces those diseases.

I have therefore unhesitatingly rejected Pyrexiaæ, as a class, as being too general, for indeed, for the reasons I have assigned,

it might have embraced almost every disease of the human body.

I have therefore commenced my classification with fevers, strictly so called; that is, those diseases which are more especially so denominated by writers, and are acknowledged to be such by the profession, and by mankind in general.

I now propose to you the following classification, as one which, though still very imperfect, I really think more conformable to nature than any yet proposed; and more than any other, subservient to the great purposes of practice—and this shall be the order in which the diseases of which I shall treat, will be considered.

SYNOPTICAL VIEW OF THE SYSTEM PROPOSED BY DAVID HOSACK.

CLASS I.—FEBRES.

ORD. I. INTERMITTENTES.

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| 1. Quotidiana. | 3. Quartana. |
| 2. Tertianæ. | |

ORD. II. REMITTENTES.

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| 4. Remittens biliosa. | 5. Remittens infantilis. |
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ORD. III. CONTINUÆ.

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|-------------------------|-----------------------|
| 6. Synocha. | 9. Pestis orientalis. |
| 7. Typhus vel Synochus. | 10. Pestis tropicus. |
| 8. Dysenteria. | |

CLASS II.—PHLEGMASIÆ.

- | | |
|--------------------|-------------------|
| 11. Phlogosis. | 25. Carditis. |
| 12. Phrenitis. | 26. Phthisis. |
| 13. Ophthalmia. | 27. Glossitis. |
| 14. Otitis. | 28. Tonsillitis. |
| 15. Odontitis. | 29. Pharyngitis. |
| 16. Parotitis. | 30. Œsophagitis. |
| 17. Mastitis. | 31. Peritonitis. |
| 18. Catarrhus. | 32. Gastritis. |
| 19. Laryngitis. | 33. Enteritis. |
| 20. Trachitis. | 34. Hepatitis. |
| 21. Bronchitis. | 35. Splenitis. |
| 22. Pertussis. | 36. Pancreatitis. |
| 23. Pneumonia. | 37. Nephritis. |
| 24. Diaphragmitis. | 38. Hysteritis. |

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|-----------------|-------------------|
| 39. Cystitis. | 43. Cruritis. |
| 40. Urethritis. | 44. Rheumatismus. |
| 41. Orchitis. | 45. Arthritis. |
| 42. Proctitis. | 46. Paronychia. |

CLASS III.—CUTANEI.*

ORD. I. PAPULÆ.

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|-----------------|--------------|
| 47. Strophulus. | 49. Prurigo. |
| 48. Lichen. | |

ORD. II. SQUAMÆ.

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|----------------|-----------------|
| 50. Lepra. | 52. Pityriasis. |
| 51. Psoriasis. | 53. Ichthyosis. |

ORD. III. EXANTHEMATA.

- | | |
|-----------------|---------------|
| 54. Rubeola. | 57. Roseola. |
| 55. Scarlatina. | 58. Purpura. |
| 56. Urticaria. | 59. Erythema. |

ORD. IV. BULLÆ.

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|-----------------|----------------|
| 60. Erysipelas. | 62. Pompholyx. |
| 61. Pemphigus. | |

ORD. V. PUSTULÆ.

- | | |
|---------------|--------------|
| 63. Impetigo. | 66. Variola. |
| 64. Porrigo. | 67. Scabies. |
| 65. Ecthyma. | |

ORD. VI. VESICULÆ.

- | | |
|----------------|---------------|
| 68. Varicella. | 72. Miliaria. |
| 69. Vaccinia. | 73. Eczema. |
| 70. Herpes. | 74. Aphthæ. |
| 71. Rupia. | |

ORD. VII. TUBERCULA.

- | | |
|----------------|--------------------|
| 75. Phyma. | 80. Sycosis. |
| 76. Verruca. | 81. Lupus. |
| 77. Molluscum. | 82. Elephantiasis. |
| 78. Vitiligo. | 83. Frambœsia. |
| 79. Acne. | |

ORD. VIII. MACULÆ.

- | | |
|--------------|------------------------|
| 84. Ephelis. | 85. Nævus, Spilus, &c. |
|--------------|------------------------|

CLASS IV.—PROFLUVIA.

ORD. I. HÆMORRHAGIÆ.

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|------------------|------------------|
| 86. Epistaxis. | 90. Hæmaturia. |
| 87. Hæmoptysis. | 91. Menorrhagia. |
| 88. Hæmatemesis. | 92. Hæmorrhoids. |
| 89. Hepatirrhœa. | |

* This class is formed upon the admirable arrangement of diseases of the skin, proposed by Dr. Willan, and improved by Dr. Bateman.

ORD. II. APOCENOSES.

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|-------------------|------------------|
| 93. Ephidrosis. | 99. Diarrhœa. |
| 94. Epiphora. | 100. Diabetes. |
| 95. Otirrhœa. | 101. Enuresis. |
| 96. Ptyalismus. | 102. Leucorrhœa. |
| 97. Galactirrhœa. | 103. Blenorrhœa. |
| 98. Cholera. | 104. Gonorrhœa. |

CLASS V.—SUPPRESSIONES.

- | | |
|------------------|----------------------|
| 105. Icterus. | 109. Dyspermatismus. |
| 106. Obstipatio. | 110. Amenorrhœa. |
| 107. Ischuria. | 111. Dyslochia. |
| 108. Dysuria. | 112. Agalactia. |

CLASS VI.—NEUROSES.

ORD. I. DYSÆSTHESIÆ.

- | | |
|---------------------|------------------|
| 113. Asphyxia. | 121. Paracusis. |
| 114. Apoplexia. | 122. Anosmia. |
| 115. Paralysis. | 123. Agheustia. |
| 116. Amaurosis. | 124. Paraphonia. |
| 117. Caligo. | 125. Psellismus. |
| 118. Dysopia. | 126. Dysphagia. |
| 119. Pseudoblepsis. | 127. Anæsthesia. |
| 120. Strabismus. | |

ORD. II. ADYNAMIÆ.

- | | |
|------------------|--------------------|
| 128. Syncope. | 131. Nymphomania. |
| 129. Dyspepsia. | 132. Anaphrodisia. |
| 130. Satyriasis. | |

ORD. III. SPASMI.

a. *In functionibus animalibus.*

- | | |
|-----------------|-------------------|
| 133. Tetanus. | 137. Epilepsia. |
| 134. Neuralgia. | 138. Catalepsia. |
| 135. Convulsio. | 139. Cephalalgia. |
| 136. Chorea. | |

b. *In functionibus vitalibus.*

- | | |
|------------------|--------------|
| 140. Sternalgia. | 142. Asthma. |
| 141. Pleuralgia. | |

c. *In functionibus naturalibus.*

- | | |
|-------------------|-------------------|
| 143. Colica. | 146. Hysteria. |
| 144. Nephralgia. | 147. Hydrophobia. |
| 145. Hysteralgia. | |

ORD. IV. VESANIÆ.

- | | |
|-------------------|-------------------|
| 148. Amentia. | 150. Melancholia. |
| 149. Oneirodynia. | 151. Mania. |

CLASS VII.—CACHEXIÆ.

ORD. I. MARCORES.

152. Marasmus.

ORD. II. INTUMESCENTIÆ.

a. *Sanguineæ*.

153. Plethora.

b. *Adiposæ*.

154. Polysarcia.

c. *Flatuosæ*.

155. Emphysema.

157. Physometra.

156. Tympanites.

d. *Aquosæ*.

158. Hydrops cellularis.

163. Hydrops uteri.

159. Hydrops cerebri.

164. Hydrops ovarii.

160. Hydrops spinæ.

165. Hydrops testis.

161. Hydrops thoracis.

166. Hydrops articuli.

162. Hydrops abdominis.

e. *Solidæ*.

167. Physconia.

ORD. III. VITIA.

168. Rachitis.

172. Scrofula.

169. Fragilitas ossium.

173. Syphilis.

170. Mollities ossium.

174. Scorbutus.

171. Lithiasis.

175. Plica.

CLASS VIII.—LOCALES.

ORD. I. TUMORES.

a. *Hæmatici*.

176. Fungus hæmatodes.

179. Ecchymoma.

177. Aneurisma.

180. Hæmatocele.

178. Varix.

b. *Adenosi*.

181. Scirrhus.

182. Carcinoma.

c. *Gelatinosi*.

183. Polypus.

185. Hydatid.

184. Ganglion.

d. *Adiposi*.

186. Sarcoma.

187. Encystis.

e. *Osteosi.*

188. Exostosis.

ORD. II. ECTOPIÆ.

189. Hernia.

191. Luxatio.

190. Prolapsus.

ORD. III. DIALYSES.

192. Vulnus.

194. Fractura.

193. Laceratio.

195. Ulcus.

ORD. IV. TYCHICA.

196. Enthesis.

198. Verminatio.

197. Venenatio.

ORD. V. DEFORMITATES.

We are now prepared to enter at once upon the description, causes, and cure of diseases. To-morrow, then, we shall begin with fevers.

“To-morrow,” in the language of the shepherd swain, Lycidas,

“To-morrow to fresh fields and pastures new.”

LECTURE III.

OF FEVERS IN GENERAL.

THE term fever, or febris in Latin, has been variously derived. Some derive it from *ferveo*, to burn, or fervor, heat. Others derive it from *februo*, a verb signifying to depurate or purify—believing fever to be an effort of the system, by which it throws off any impurities which may be received or engendered in the body. The Greeks denominated it *πυρεξίς*, and *πυρατος*, from *πυρ*, fire.

Fever is one of the most common, and one of the most dangerous affections of the human frame. It is common to both sexes. All ages are subject to it. It is found in all countries and in all climates. None are exempt. Sydenham supposed fever, strictly so called, to constitute two-thirds of the diseases which prove fatal to the human species; and he has calculated that eight out of nine of all who die, are cut off by febrile diseases. This computation is too high, considering fever in the limited sense in which we employ it. But, considering it as comprehending every affection in which the febrile state exists, it certainly makes up a very large proportion of the diseases fatal to mankind. Indeed, fever is so universal a disease, that it may be said few either live or die without it. Few go out of the world or remain in it without fever.

By Hesiod, fevers are hence denominated by the general term, “disease.” And Horace in emptying Pandora’s box, calls all diseases, “fevers.”

“Post ignem ætherea domo
Subductum macies, et nova *februm*,
Terris incubuit cohors.”

Its importance, therefore, to the physician, and consequently to the student, becomes very apparent, especially when we view it as one of the great outlets to human life. Indeed, a physician is or is not entitled to that distinguished appellation; he is or is not skilful, successful, or eminent, in proportion as he is or is not acquainted with this important class of diseases. And as he is well instructed in the nature and treatment of fevers, he will be successful in the treatment of diseases in general, as all diseases occasionally assume a febrile character. Hence Dr. Gregory used to devote the greater part of the six months' session to this subject, and the phlegmasiæ; for he very rarely reached the second class of diseases in the arrangement of Dr. Cullen, which, with all its defects and errors, is adopted in the university of Edinburgh!

What is fever? It is difficult to answer this question. It has become almost a proverb, that the wisest man knows not the nature of a fever. Notwithstanding the long experience of mankind on this subject, and the investigation which has been bestowed upon it by physicians, much yet remains to be done in the investigation of this intricate subject. The only safe mode of procedure in arriving at a knowledge of this condition of body, will be carefully to note the facts which have presented themselves on this subject: for as that great practical observer, Sydenham, justly observes, "If we seriously attend to what nature actually performs, and observe what instruments she uses in her work, we may be able to discover her operations; but," he adds, "the manner in which she operates, if I am not mistaken, will always be concealed."

It is therefore proposed first to notice the symptoms of fever.

Symptom is a Greek word, derived from the verb *συμπιπτω*, to happen—to occur. It signifies thence, an appearance or occurrence. It is a term, moreover, appropriated to disease, but not to health. We say phenomena of health, but we say symptoms of disease. Another term made use of as adjective to symptom, is pathognomonic, derived from *παθος*, an affection, and *γινωσκω*, to know; meaning thereby those peculiar symptoms by which the affection or disease may be known, to distinguish it from all others. Diagnostic is another adjective, frequently made use of by the physician, as expressing the

quality of symptoms, and signifies those symptoms by which any two or more diseases may be distinguished from one another—i. e. by which two or more diseases, having a close resemblance, may be separated from each other—as plague and yellow fever.

The term *pyrexia*, made use of by Dr. Cullen, (the *febris* of authors) was first introduced as synonymous with fever, by Sauvages. But Dr. Cullen first used it as the name of a class. Read Cullen's definition of the *pyrexia*, "*post horrorem pulsus frequens, calor major, plures functiones læsæ, viribus presertim artuum imminutis.*"

Of the *post horrorem*, Dr. Cullen was very tenacious in his description of fever. Not one, says he, of a thousand occurs without it.

Boerhaave also considers chilliness essential in all fevers arising from internal causes. By internal cause, he meant that which existed in the body, before the fever appeared; and that whether generated within the body, or introduced into it from without. The bile vitiated, is an example of the first; the pestilential contagion of small-pox, of the last. Yet both exist in the system before the fever makes its appearance; and, therefore, are considered as internal causes. But shivering, Boerhaave observes, is not present when fever proceeds from external causes, as sudden anger—violent and long-continued exercise. Then "no coldness, (he remarks,) is perceived to precede fever." Nor is it true of cases arising from internal causes that the chill is always present. It is an objection then to Dr. Cullen's definition of *pyrexia*, that some fevers are not preceded by chill or shivering. This fact was noticed as early as the time of Celsus. "*Aliæ protinus à calore incipiunt.*" *De Med. lib. 3. cap. 3.* The same has been observed by many moderns: as Gorter, *Compend. Med. Tract. 52. § 3.* Burserius *Inst. Med. Pract. vol. 1. p. 83*; by For- dyce, *Diss. on Simp. Fever, p. 11*; and by Dr. Gregory, who remarks, that in the common quotidian there is frequently no cold stage.

Cases of yellow fever too have frequently occurred, in which the patients were very suddenly seized with all the violence characteristic of that disease, without the least preceding sense

of coldness. So in plague also; even in intermittents, I have observed the same fact.

Hence, probably, has arisen the supposed distinction which is made by the vulgar between the intermittent and the fever and ague.

In other respects, Dr. Cullen's definition of pyrexia contains for the most part a correct character of fever, except that "*viribus artuum imminutis*," is not properly applicable as mere debility, but as the effect of irritation, depriving the patient of an inclination for exertion and begetting a sense of lassitude. But Dr. Cullen doubtless intended to convey the idea of pure debility; for by this supposed debility, he intended to strengthen his favourite hypothesis of debility's constituting the proximate cause of fever.

But when we come to look at his definition of fever, strictly so called, we shall find it exceptionable throughout—"prægressis languore, lassitudine et aliis debilitatis signis, pyrexia sine morbo locali." I assert, there is not one word of truth in this whole definition. On the contrary, the invasion of fever is frequently sudden, without any previous languor or lassitude, without any precursor or premonitory feelings whatever, and most commonly, or at least very often, without any debility, previous to the symptoms of increased action. And sometimes fever is attended with local affections from the commencement—as of the brain, showing itself in violent pain of the head, delirium, and even mania. Indeed, Clutterbuck would have you believe, that all fevers arise from and consist in an inflammation of the brain. Dr. Parr considers a tension of the tendons of the wrist to be a constant symptom of fever. Dr. Fordyce also considers some mental alienation to be present in every fever.

Such local affection shows itself also in the lungs in coughing, as in typhus. The throat too, in the commencement of typhus, is frequently sore and even inflamed, owing to the state of the stomach.

The stomach too is frequently affected from the beginning with vomiting, as in yellow fever; and that too, in some cases is irrestrainable—such is the sensibility of that viscus to the operation of the poison of that disease.

And in plague the glands of the groin and axilla are some-

times among the first seats of irritation. It is accordingly remarked by almost all writers, that in proportion as those local affections appear early in the plague, the disease of the whole system becomes mild. Dr. Russel observes, that some cases of plague he prescribed for from his window—the patient having nothing but local affections or buboes. This, therefore, is a bad definition given of fever by Dr. Cullen.

Galen considered fever a preternatural heat generated in the heart, and from thence diffused throughout the body.

It is true, that the greatest source of heat is in the neighbourhood of the heart, viz. in the lungs, the fire-place where, by the constant condensation of the oxygen, the caloric which gave the oxygen its gaseous state is disengaged. It is now, however, considered that the lungs are not the only source of the heat of the system; but that the various processes of digestion, chylification and assimilation, indeed, that all the decompositions and new combinations in our system, are attended with an extrication of caloric, besides that arising from the process of respiration.

Sennertus and Vogel following the ancients, Galen and others, made increased heat alone the essence or proximate cause of fever. There is great error in this respect. In the first place, the feelings of a physician mislead him, for the sense of feeling like all the other senses is frequently fallacious. The sense of heat must necessarily too be relative, according to the temperature of our own bodies, or that temperature to which we had been previously exposed, or have just come from: and before the time of Van Helmont (who was born 1577, and died 1644,) we had no measure of heat by the glass and mercury. Indeed, this measure was only made use of within the last hundred years.

Van Helmont first invented a measure of heat by the expansion of air in a glass globe, pushing up when heated a fluid through a small cylinder, and allowing, when cold, the fluid to descend. By this instrument, as it was afterwards improved, we now measure the apparent heat of bodies. But besides the fallacy of our feelings, in some instances the heat of the patient is not increased, it is even lessened, as in the first stage of fever; yet the pulse is, perhaps, increased in frequency. Dr.

Cullen admits this to be the case, as you will find by consulting his notes. His notes he finds very convenient to relieve himself from the difficulties in which he becomes involved in his text—"neque calor major, &c. to negere nolo." See Nosologia, p. 43.

Heat being the result of quickened circulation and quickened respiration, must necessarily be absent in the first stage of most fevers, as it requires time to produce that effect, and therefore it is not to be looked for as a pathognomonic or essential characteristic symptom of fever: on the contrary, in some cases it is even reduced below the natural temperature. Fordyce found it less in fever by actual measurement, and yet all other appearances denoting fever were present. He found it at 96° , 95° , and even at 94° ; and that too under the tongue, (the natural temperature of the body in health is 98 , or rather $97\frac{1}{2}$ under the tongue.) Dr. Currie states, that he has found the heat under the tongue and in the axilla as low as 94° , 93° , and even down to 92° , (see Med. Reports on cold and warm water in fevers, 2d ed. p. 168,) and in other cases Dr. Fordyce remarks, that the patient feeling cold, his heat was up to 104° and 105° —indeed 110° and 112° , are mentioned by authors. The experiments of Dr. Fordyce frequently show no increase of cold, though it is felt and complained of by the patient. But the heat of the body is also very variable, and that too frequently in a few minutes, depending on accidental circumstances. It will depend somewhat upon the temperament of body, upon the condition of the nervous system, as well as the circulation. Hence the heat of some persons is greater than that of others. I have oftentimes met with this extraordinary degree of heat in persons of the nervous temperament, in which a great quantity of blood circulates upon the more sensible parts of the body. This is the case with myself.

In very fat persons the temperature of the surface of the body is deceiving—for the skin in very fat persons is to a degree insulated and relatively cold, from the mass of fat beneath, which is a non-conducting medium; as is the case in some children as well as adults. The elder Dr. Bard was hence in the habit, when prescribing for children, of feeling the forehead, not trusting to the extremities to ascertain the heat

of the body—for where the limbs are disproportionately large, they are generally cool.

In ascertaining the temperature of the body, you will therefore recollect, that feeling the limb is not a test of the degree of caloric present. To obviate this difficulty, the thermometer must be applied to some other part of the body for this purpose. Dr. Currie had a curved thermometer purposely constructed, that it may be introduced into the mouth, or in the axilla, or any other part of the body that possesses a pretty uniform degree of heat.

Heat, therefore, is not a pathognomonic symptom of fever.

Heat too is frequently partial in its operation, as in typhus fever; and frequently in convalescence shows itself in the more sensible parts of the body, as in the temples—the cheeks—palms of the hands—soles of the feet—and yet there is no fever present. Celsus, therefore, may with great propriety say of heat as of the other supposed characteristics, that it is “*æque fallax*.”

Sylvius and Boerhaave were no less in error, in making the velocity of the pulse one of the essential characters of fever.

The pulse has in all ages been referred to, as an evidence of fever.

The pulse, before the time of Celsus, was not much noticed.

Galen says, that Hippocrates was the first who mentioned the pulse—he however did not place great dependence upon it. Hippocrates certainly examined the pulse, and judged of the violence, of fever by it:—thus, he says, the pulsations in lethargic patients are slow—that he found the pulsations slow and trembling in Zoïlus the workman. In the case of Polycrates too, he observes that the fever was so gentle, that the pulse seemed to stand still, except in the temples. And again, he remarks, that in the most acute diseases, the pulsations are the largest and hardest.—(See his Prognostics.)

The pulse was more noticed afterwards by Herophilus and Erasistratus, and particularly by Aretæus. But in the time of Celsus, it became an object of considerable attention. Yet Celsus, speaking of it as a criterion of fever, has well called it, “*fallacissima res*.”

“In every fever,” says Boerhaave, (I mean Herman, the

sun of the medical world,) “ arising from internal causes, there is always a shivering, a quick pulse, and heat varying in degree at different times of the fever.” This observation is certainly incorrect, for though great heat may be present, the pulse sometimes is in fever not quicker than natural. Nay, in some cases it is slower, for we may observe that quickness of the circulation and the degree of heat are not invariably proportioned one to the other, although they are generally so. The general standard of the pulse we know to be about seventy-three, with men of active habits; and while actively engaged, it is somewhat quicker. In truth, we may say it is rarely less than seventy, nor more than seventy-five. It is not so more than once in a thousand cases, excepting in old age, or when the constitution may possess some peculiarities or idiosyncrasies, as in the charter-house man, noticed by For-
dyce, whose pulse did not exceed twenty-six. I have also had a patient in this city, whose pulse did not exceed forty-five, though he enjoyed good health. He died in his 80th year. In early and active life it never exceeded sixty, and even during fever it was not very perceptibly quickened, yet every other symptom of fever was present. In infancy the pulse is more frequent than in the adult, oftentimes exceeding a hundred in a minute, and that too in health.

Dr. Gregory related to us a case in which the pulse during fever was always diminished instead of being increased in frequency. In that case the constriction attendant on fever, it appears, was not confined to the smaller vessels, but extended to the heart and larger vessels also. The subject had been a patient of his father and himself.*

Sydenham has observed of a malignant fever (*febris hymalis*,) that during the first days, the pulse was that of health. “*Sanorum pulsui non admodum absimilis.*”—*Tractat. de hydropse postcripto.*

I have oftentimes seen the same in yellow fever, and that

* My original note taken in 1792. Pulse.—Instance of a man by Dr. Gregory, whose pulse in health is 120—also of one whose pulse naturally did not exceed 50, and when at 70 or 72, the natural standard, he was dangerously ill. Of a man also, whose pulse in health was quick and irregular, viz. 120 per minute, but in fever, became both slower and regular.

too throughout the whole course of the disease. The same fact has been observed in small-pox.

Greding has observed the same in a contagious epidemic fever, as you will see in Ludwig *Adversar. Med.* vol. I. pt. 1. cap. 1. p. 22.

That the pulse is slower than natural, has frequently been observed in malignant fevers, especially those proceeding from contagion. In typhus fever the pulse is frequently observed to be less than the natural standard, down sometimes to sixty, fifty, forty-five, and even to thirty, while other symptoms of fever are present. Even in inflammatory complaints, the pulse in some cases is very small and difficult to be perceived.

Similar facts are stated by Burserius, p. 84, by Russel, in his *Diseases of Aleppo*, p. 230; by Sauvages, tom. 2. p. 307. De Haen in his *Rat. Medend.* pt. 12. cap. 2. p. 50 et 117.

The last mentioned author observed, that in a particular case, as in Dr. Gregory's clergyman, it was not only slower during the continuance of the fever, but became quicker during convalescence and health; nothing is more common than the quick pulse and a corresponding degree of heat in convalescence, though the patient is free from fever.

Home also states, that he has lost patients of typhus fever, in whom the pulse was not quickened. The depressing or sedative effects of the contagion producing typhus, is not unfrequently exhibited in this manner on the arterial system.—(See also Pringle, Lind, and Fordyce, for similar facts.)

The latter, in St. Thomas's hospital, frequently called his pupils' attention to this irregularity of the pulse—this almost capriciousness as it might be denominated, in malignant fevers.

In diseases too of no danger, the pulse is sometimes very inordinately accelerated. In a common catarrh, it is often as high as 120; in cynanche tonsillaris, 130 or 140 or 150; but the same frequency in continued fever is generally attended with great danger.

Again, we frequently find no fever, even when the pulse is quickened beyond the natural standard—because it is much influenced by the state of the nervous system.

Let me tell you the case of Mr. Boyd, a pupil of mine, who was ill of the yellow fever in 1795. I did not feel very confident as to his safety, and called Dr. Bard to visit him. The

Doctor, upon feeling his pulse, without giving much attention to his other functions, instantly turned on his heel, and walked out. "Hosack," said he, "this man will die." "I hope not, sir." "Did you feel his pulse?" he added.—I returned to make a more particular inquiry as to his situation, and found his pulse quite as tranquil as I had done before Dr. Bard's visit. I also found he had been out of bed on his chair, and hearing us coming to his room, hurried to his bed, which excited his circulation at the moment. In that moment of agitation, Dr. Bard felt his pulse—he recovered. Getting out of bed in ordinary cases, or any other bodily exertion in this irritable state of the system, accelerates the circulation.

The same thing occurs during the exercise of walking, running, dancing, or even the exercise of gestation, as riding on horseback, or in a carriage. Yet, with this temporary acceleration of the heart or vessels, no fever is produced.

In like manner in spasmodic affections, as of the intestines, the pulse is sometimes quickened to a hundred, yet no fever exists. In palpitation of the heart also, the pulse is very rapid, but it does not constitute fever.

The pulse is no less affected by the passions of the mind, than it is by other impressions made upon the nervous system, or the peculiar irritation, which is the cause of the disease. When the fair one meets her intended, her heart may be literally said to leap with joy. But her arteries are also excited and her pulse is quickened, not by their own vis insita, but by impressions made through the medium of the mind upon her nervous system.

There was a case during my attendance in the Pennsylvania Hospital, in 1789: a poor man was ill of dropsy—bed-ridden and debilitated, of course irritable and alive to every impression. The approach of the physician and a retinue of pupils, as you will suppose, (for they did not observe that decorum in the wards of the sick, that they do at this day,) agitated him—his pulse was greatly excited, and in that increased action venesection was prescribed by Dr. Rush—the poor man died within four hours after the operation.

It is a good rule, therefore, not to feel the pulse of your patient immediately upon your entrance into the sick room; for the very opening or shutting of the door, the appearance of

a new object before your patient, excites the heart and vessels to more frequent action, which may deceive you.

Celsus, speaking of the effects of fear, anger, and the other passions and emotions of the mind—the effects of heat and exercise, &c., on the pulse, has well observed, “*Quam facile mille res turbant;*” “how easily is it affected by a thousand things.”

Neither the pulse, nor the temperature then can be considered as pathognomonic symptoms of fever; nor consequently, respiration; for it, like the pulse, is much influenced by the state of the nervous system, as well as the circulation.

Boerhaave used to tell his pupils, that he had been at great labour to assemble from different authors, the symptoms of fever; and that from this catalogue he blotted out all those symptoms which he did not find to be present in all fevers. He found of all the catalogue he had collected, but three remained—shivering, a quick pulse, and heat. But upon the same principle, he might have blotted them all out, for no one, as we have seen, is invariably present: no one is to be considered as a characteristic or pathognomonic evidence of fever.

I have thus endeavoured to show you, what fever is *not*.

Dr. Rush has well observed, that before we can arrive at truth upon any subject, we must first exhaust it of all its errors. Some of these we have endeavoured to clear away as preparatory to a more distinct view of this important subject. In our next we shall show you, that in every fever there is a concurrence of many symptoms, in some more, in others less.

LECTURE IV.

THE SYMPTOMS OF FEVERS IN GENERAL.

AGREEABLY to the plan announced to you yesterday, it is now proposed to call your attention to the concurrence of various symptoms which enter into, or constitute fever. And in doing so, we shall detail the various symptoms in the order in which they usually take place, noticing not only those appertaining to a particular species of fever, but those which belong to fever in general, under whatever shape or form it may appear; whether intermitting—remitting, or continued, reserving the peculiar symptoms of each specific form for future and distinct consideration.

This plan has an advantage as subservient to practice. For after the general view we propose to take, we shall be prepared for every deviation or change which may occur in any particular species. We shall not only readily know the various grades of malignancy which may occur, but we shall also be prepared to apply the general principles of treatment, and to adapt that treatment to each particular case that may present itself, and to the various grades and modifications which may occur even in the same case.

Cullen, Fordyce, and others, take as their standard the paroxysm of an intermittent! This is certainly incorrect, to make the peculiar form of an intermittent the standard for all! An intermittent for a continued fever!

Dr. Cullen doubtless found it very favourable to his peculiar views relative to the nature and proximate cause of fever, in which unfortunately he has been blindly followed by others. I say blindly followed, for there is certainly not that affinity between

the intermittent and continued form of fever that writers have imagined—nor that unity which our countryman, Dr. Rush, supposed; the one, therefore, cannot stand as the prototype of the others. The paroxysms of the one are not found in the others, as they have been represented. Many believe that every continued fever consists of the paroxysms of an intermittent running into each other; that all fevers are originally intermittents—to use a chemical expression, that they all have an intermittent base. This idea is too absurd to call for a serious refutation, although it is the error of two of the most celebrated practical physicians.

The whole of the symptoms which occur in fever in all its various forms, will now be presented to you, as preferable to the partial view which each specific fever exhibits. Knowing the whole, we shall afterwards readily recognise the parts which compose it. Much labour too will be saved, inasmuch as after the general description now to be given, we shall in describing particular fevers, more especially confine ourselves to their characteristic symptoms, omitting altogether those they possess in common.

Fever I define to be, an affection of the whole system.

Some affect to say, that this definition is too extensive—they ask, how is it possible that fever can affect the whole system? What effect can fever have upon the bones? upon the cartilages or the ligaments? But when Hippocrates in his seventh aphorism states, that a wound penetrating into the cavity of a bone, may produce a delirium, we find no difficulty in admitting the connexion between the bones and the brain—why, therefore, should not a similar connexion exist when the brain or blood-vessels are primarily affected? And do we not oftentimes find the bones affected with disease as the consequence of fevers? viz. rheumatism, white-swelling, necrosis, &c.

My definition, that fever is “a disturbance of all the functions,” is adopted by Dr. Wright—(see *Med. Chir. Journal*, new series, p. 311. vol. 1.) lately too by Prof. Jackson of Boston, and by Dr. Potter of Baltimore; and, indeed, the same is now adopted substantially in the Philadelphia school.

We shall now proceed to show you, that fever is a disease of the whole system—a disturbance of all the functions; that it

appears no less in the faculties of the mind, than in the functions of the bodily structure—that it shows itself in every organ of our frame, and affects every nerve and fibre of the system. That the absorbing, the circulating, and the secerning systems of vessels are all affected by it; that it shows itself in the fluids as well as the solids. In a word, that it is omnipresent—that it has no one pathognomonic symptom, but is constituted by a concurrence of symptoms.

Yet it is to be understood, that all the symptoms which are met with in fever, are not combined in every case. In this respect, there is an endless variety. As for example—the state of the tongue, which is generally considered by physicians as an index of the presence and state of fever, yet a very fallacious one. In inflammatory fever it is for the most part white, furred, and dry; but in plague and in yellow fever, and other contagious fevers, it is frequently moist and clean throughout the whole course of the disease. In the bilious remitting fever, as it ordinarily appears in this country, the tongue is uniformly foul and loaded, not with a white fur, but with a yellow sordes; and in typhus fever it is dry, red, brown, and black. So with regard to headach, this is sometimes present, at other times absent; and so with pain in the back, loins, and limbs, chill, affections of the stomach,—in some persons, one of these symptoms occurs—in others another, and in a third, a different symptom.

We may, indeed, observe of fever, that there is no one symptom but is occasionally absent, and no one but is occasionally present. Nor in fever are all the parts of the system equally or uniformly affected. Sometimes one part, sometimes another is more affected; depending upon temperament, season of the year, climate, and a thousand other circumstances.

Fevers differ in their duration and violence, as well as in their character, from the ephemera or fever of a day (occasioned by a feast or a debauch,) to a six weeks' typhus fever, or the long nervous fever, as it was formerly denominated.

Seeing then that there is no one symptom or circumstance to characterise fever—neither chill, nor pulse, nor heat, nor state of the respiration—Dr. Cullen has added to his “*calor major*,” and “*pulsus frequens*,” the “*functiones læsæ*,”—the deranged or disturbed state of the functions with which he

should have begun, instead of the “*progressis languore.*” But, as I have already intimated, he had his peculiar reasons for it—he had a theory, a peculiar doctrine to support, or rather the baseless fabric of a vision. Let us respect the memory of Dr. Cullen; but let us respect truth more. “*Amicus Plato sed majus amica veritas,*” is our motto. The services of Dr. Cullen to his profession have been great, they are invaluable. They, however, chiefly appear in his description of diseases: this is the best part of his works. But although much of that was taken from Hoffmann, and from Sydenham, and without the due acknowledgment of the sources from whence he derived such details, yet he himself also collected much from the book of nature at the bedside. And it is to be remarked, and to the honour of Dr. Cullen, that he never suffered his own hypothesis to accompany him to the bedside. His treatment of diseases was ever the result of his cautious and judicious experience and observation. Like Galen of old, he had too much good sense to be governed even by his own peculiar doctrines.

In proceeding to give a description of fever, I observe, first, That the invasion of fever is frequently *sudden*. Dr. Fordyce remarks, “that he has known several instances where persons sitting down at the table with a strong appetite, an attack of fever having suddenly taken place, in less than two minutes they have been seized with perfect aversion even to the smell of food.” p. 93.

2. Fever occurs most frequently *at night*, when the body is most susceptible of irritation, especially those fevers which take place after exposure to cold,—as all inflammatory fevers, and especially in children, owing to the greater sensibility of their system. Indeed this is the case in most inflammatory complaints. The same thing occurs in most nervous affections; so with worms and other irritations of the bowels. So also with parturition. In like manner with fever proceeding from contagion, its operation is not perceived in the day, when the system is under other impressions, but shows itself at night when other stimuli are withdrawn. Dr. Fordyce remarks that in London, ten to one attacked with fever, are seized between 8 A. M. and 8 P. M., compared with those attacked at

night, or from 8 P. M. to 8 A. M. This is certainly not the fact in this country. But we shall have frequent occasions to call in question the correctness of many of the opinions and observations, even of that excellent observer, Dr. Fordyce. He may, perhaps, be correct in recording the phenomena of fever as they appear in Great Britain. But in America, in this instance, they are not applicable.

3. Fever occurs too frequently under *predisposition*, arising from the state of the air, changes in its temperature and quality, and the condition of our fluids. We thereby frequently acquire a combustible state of body that is readily lighted up into fever. The northern man is readily inflamed by the rays of a tropical sun, and especially so when great numbers are congregated in small confined apartments, and the fluids of the system partake of the vitiated state of the air, produced by such confinement and want of ventilation. In such a fermentable state of body, our fluids, like an impure atmosphere, are easily assimilated to the taint that may be introduced into them.

The first symptoms of fever denote irritation in the nervous system, producing restlessness and uneasiness, both in the mind and body. In some the passion of anger is excited—the patient, though originally of good temper, now quarrels with his best friends—takes offence even at every act of kindness. The mind becomes impatient, peevish, restless—passes rapidly from one object to another, and is incapable of steady mental exertion—the patient cannot think or reason even upon ordinary subjects with his usual ease; and as the disease advances, the mind also becomes excited, and not unfrequently exhibits a character never known before. Senac informs us that he once knew a woman who, just before the paroxysm, became very loquacious, nor was the approach of the disease announced to the bystanders by any other sign—see Senac on Fevers, p. 29. During the excitement of fever, in the case of a lady, which occurred in this city, the imagination became so highly excited, that it displayed itself in a talent for poetry. Every thing she said during her paroxysms, was uttered in couplets, many of which were very correct and very beautiful. Yet she had never in health exhibited any extraordinary predominance of the imagination over the other faculties of her mind. In

another lady who, upon other occasions, had never been accused of wit, the mind was so powerfully influenced by the excitement of fever, that she uttered some of the most pointed expressions that the strongest intellect could have conceived. In one of those paroxysms, I requested her to put out her tongue. She did so. I requested her to put it out still farther—a little farther ma'am.—“Why, I believe, Doctor, you think there is no end to a woman’s tongue,” was her reply. Yet on no other occasion did this lady ever show the sudden and unexpected combination constituting wit.

In the advanced stage of fever, it is known that delirium and even mania are not unfrequently among its attendant symptoms; but in the very commencement of fever, the mind is similarly affected, though in a less degree, showing itself in great impatience and anxiety. Perception, memory, judgment, reasoning, are all more or less disturbed by the invasion of fever. The mind becomes hurried in all its movements, and acquires the same febrile state with the body. In some, the agitation is very considerable and very apparent, and attended with great anxiety—frequently analogous to that which appears in women at the approach of labour, and which irritation is of the same febrile character.

But fever produces also, in other respects, an affection of the brain and nervous system, showing itself in the bodily organs as well as the mental. It produces pain of the head; sometimes the forehead and eyes are more especially the seat of irritation. This is frequently the case in yellow fever and the plague. In other instances the nerves of the ear are peculiarly and violently affected, and in some instances the pain is exclusively seated in the posterior part of the head, the cerebellum, producing stupor.

Dr. Fordyce makes a distinction on this subject. He considers the pain to be external in the first stage!—but in the second stage internal, which last he believes to be entirely the effect of the increased circulation in the carotids, and both occasionally producing delirium. His distinction is certainly not a just one; the true explanation appears to me to be, that in the first stage, one cause is operating, viz. the impressions made upon the nervous system chiefly, if not exclusively. But in the second, two causes are co-operating to produce the

same effect, i. e. the increased impetus of the blood is now added to the primary impressions made by the invasion of the disease on the nervous system—but which first impressions are in some instances so violent as to produce all which have been ascribed to both combined. The pain, therefore, attendant on the invasion of fever, cannot be considered as external in its operation.

Pain also appears in the back, and that too, whether the patient be lying down or sitting up. Not, however, like the pain occasioned by debility after a fever, in which the patient is unable to sit up without an increase of it; but like that which attends upon parturition—upon excessive venery, or is occasioned by self-pollution, which peculiarly affects the loins, and chiefly consists in irritation exclusively showing itself in the nervous system. So with fevers also: the irritation manifests itself upon the spinal marrow, and the principal nerves proceeding from it. Hence, too, the patient complains of pains in the limbs following the course of the larger nerves analogous to the pains of rheumatism. Sometimes, this pain is in one limb—most usually in both. This is especially the case in yellow fever and plague, and other fevers arising from contagion. The pain in some instances is so severe that the patient feels as if his bones would be broken by it, (constituting the break-bone-fever, as Dr. Rush has denominated it,) attended in some cases with such distressing feelings as to be more appropriately called by the name given to it by a fair patient of the Doctor's, the break-heart-fever. A lady who was attacked with the same fever, experienced a very unusual degree of depression in her spirits. In her the disease vented itself upon her more tender feelings. She accordingly was thence led to give it the name of break-heart-fever.

These pains denote frequently too the returning paroxysm of an intermittent,—pain of the back especially, though no other symptoms are present.

Fever also produces a disinclination for bodily, as well as mental exertion. This has been very improperly called debility* by Dr. Cullen; for the power of exertion is not lost, but suspended. And it applies equally to mind and body—for

* It is a common error and often a fatal one, to mistake oppression for debility.

the paroxysm of fever being removed, the tone and vigour of both are restored, and at the time too when the debility is greatest, or should be so, i. e. when the paroxysm is ended.

The nervous system manifests this invasion of fever in various ways. In infancy and childhood it frequently shows itself in tremor, starting, dreams, talking in sleep, (somniloquism) walking in sleep, (somnambulism) subsultus tendinum, grinding the teeth, chattering of the teeth, rigours and convulsions. Dreams are not only the common attendants on the very first stage of fever, especially in children; they are not only oftentimes premonitory of fever; but they also very frequently, in the process of fever, constitute the first degree of delirium in adults.

In some cases, the adult is thus attacked. A patient of mine, upon the attack of an intermittent, was seized with convulsions, indicating the symptoms more of an apoplexy than of an intermittent fever, constituting what Alibert calls the apoplectic form of intermittent. Indeed, some old persons are thus seized with apoplexy, occasioned by the first invasion of fever. Hence it is said, that when an intermittent proves fatal to old persons, it does so during the first attack, and especially during the chill. Dr. Bard, senr., was thus affected in the first invasion of the disease which proved fatal to him. In every epidemic yellow fever with which the United States have been visited, some have suddenly died from this cause, and have dropped in the street, or have been found dead in their beds.

The same thing has been observed of the plague. Lucretius tells us so in his description of the plague of Athens. Sydenham observes that during the first months in which the plague raged in London, people dropped down dead every day. In others, the invasion shows itself in stupor.

These inflammatory symptoms attendant upon the first stage of typhus, I have many years since been apprised of—long before the publication of Dr. Armstrong's book.

In other cases again, the patient becomes instantly maniacal from a state apparently of perfect health. It is recorded by Diodorus of the fever of Syracuse, that the sick instantly became delirious, and beat all who came in their way. A case is related by Dr. Gregory, in which a quartan was thus regularly announced by delirium, instead of the usual chill or rigor.

Delirium we know to be the frequent attendant in every stage of fever. More commonly, however, the first stage of fever affects the nervous system by pain, tremor, and rigor, especially in children. In some I have seen it exhilarate the patient exceedingly. Children in hives frequently manifest this symptom before the disease shows itself in the blood-vessels.

In other persons again, I have seen the invasion of fever produce hysteria, not only in women, but in men; only, however, in those of the nervous temperament, or who have created that temperament by intemperance.

I have known an old gentleman thus attacked with hysteria, threatening convulsions. He was agitated, and sobbed like a young girl.

In all persons you will observe great restlessness—the patient tossing from one side of the bed to another, except when stupor is produced. Indeed, the whole frame is agitated and hurried; it manifests itself in every act the patient performs. Upon giving him his drink, he receives it from you in haste—he takes it from you rapidly—he swallows it with the same hurry and agitation. If you ask a question, he answers you in the same impetuous manner. His respiration too partakes of the same hurry, and is frequently attended with great impatience, anxiety and heavy sighing, particularly in fevers arising from contagion. And let me add, that under such circumstances, this is frequently a fatal symptom.

The external senses are no less affected in the first stage of fever. The sense of vision manifests the irritation of fever—the patient complains of a degree of heat and burning in his eyes, attended with a great sensibility to light. In some instances it shows itself in an instantaneous and extraordinary redness of the eyes, attended with an inflammation of the glands, and an effusion of tears, and those of an acrid saline quality. These circumstances are frequently met with in the plague, yellow fever, influenza, measles, scarlatina, and other diseases proceeding from contagion. The state of the retina is also sometimes so much impaired, that the patient believes he sees a variety of objects passing before him which have no existence, the *muscæ volitantes*, as they are thence denominated. Motes of this kind are constantly created by this state of the nerves. In other instances the irritation shows itself in

producing an irregular action of the external muscles of the eyes. Strabismus or squinting is the consequence, and perhaps only exists during the irritation of fever. One of my own family is thus affected whenever any strong impression is made upon his nervous system, whether from fever, fear, or anxiety, but never squints at any other time. The sense of hearing is also affected. The patient hears imaginary sounds; the sensibility of the ear is so much quickened to real impressions, that he hears even the pulsations of the arteries of the ear. But this symptom occurs, as it regards both real and imaginary objects, more commonly in the advanced stage of fever, constituting what practical writers hence denominate *tinnitus aurium*. But where the sensibility of the constitution is great, or the irritation of the disease is strong, this symptom exists from the first. The taste is in like manner depraved and vitiated, insomuch that the patient scarcely distinguishes his medicines from his food or his drinks. Whereas, before, his sense of taste may, perhaps, have been very acute. The sense of smell is also frequently impaired or even suspended. The feeling is especially affected. In some instances the patient supposes he feels insects creeping over his skin, or hairs pricking him: some are insensible to heat. A case once occurred to me of a person who was severely burnt by the application of a hot iron in the commencement of fever. The same patient was confined three months by an ulcer thus produced. More commonly, however, the patient complains of great coldness, when the body is even preternaturally heated; and this too to a degree of shivering, called *horripilatio*, making the papillæ of the skin and the very hairs erect themselves. Hence the origin of the term. As an evidence of this sense of coldness, although the patient may be unusually covered, he complains that he wants more clothes, or wants to approach the fire—calls for hot drinks—takes them much hotter than he could possibly do in health; and all this time the body is perhaps preternaturally heated, as shown by the thermometer. Frequently, however, the heat is actually reduced by the first irritations of the nervous system—and the circulation diminished in the small vessels upon the extreme parts of the body—and the extremities become cold, especially when the

communis choledocus, or the urinary calculus in the ureter, sometimes excites the most severe rigours. A catheter in the bladder—an enema in the rectum—caustic applied for stricture of the urethra—strangulation of the intestines—hemorrhagic affections—pus in the blood-vessels, I have known to produce similar rigours without any peculiar affection of the stomach.

A case is related by Senac, of a soldier who died of a rigour that lasted two days, induced by a large abscess in the liver. The rigours, therefore, in an intermittent, upon the same principle, may be accounted for as the result of an analogous irritation of the nervous system, occasioned by the usual causes of intermittents, particularly marsh effluvia. But we may easily account for the mistake of Dr. Fordyce, when we take into view the extensive connexions which the stomach holds with the nervous system by means of its ganglions—its nerves—the cæliac plexus—the great intercostal, and its immediate correspondence with the brain through the intervention of the eighth pair or the par vagum, constituting the stomach, as I have already expressed it, a sort of second brain in the system. By referring to Whytt's experiments, and still more recently, those of Wilson, the tying of the eighth pair in a dog, you will see the injury it occasioned in impairing the functions of the stomach.

It is certainly surprising that Dr. Fordyce, with his long experience, his talent for investigation, and his acquaintance with pathology, should have had so limited, so short-sighted a view of this subject, as to refer those phenomena to a single organ. The whole body should be looked at. The body, like a building, should be surveyed in toto, and all its parts in connexion taken into view. They should be viewed, too, at a proper distance—every object has its focal distance—we should not merely see the fly on the castle. Clutterbuck, in like manner, saw nothing but the brain amidst all the phenomena which fever produces!! His doctrine traces all fever, forsooth, to inflammation of the brain! It would be wasting your time, gentlemen, to notice the absurdity of Dr. Clutterbuck's whims on this subject—you may read his book if you please, to see to what ridiculous lengths a man will suffer himself to be carried by a favourite notion.

The same remark will apply to the fanciful theories of some recent writers of the French school, who refer all fever to inflammation of the mucous lining of the alimentary canal. Every thing with these new-fangled pathologists, is *gastro-enteritis*! *Risum teneatis, amici*? But a Frenchman, you know, is very apt to think a great deal about his *stomach*! The truth is, these new-fashioned theorists mistake the effect for the cause. The *post-mortem* appearances to which they so triumphantly appeal as evidence of their doctrine, are generally nothing more than the results of the disease; often they are the effects of acrid medicines, and other injudicious prescriptions; frequently, the changes produced by the very act of dying, or consequent upon death;* and perhaps, even more frequently, nothing more than the proofs that the patient has perished because his physician has, instead of properly cleansing the *primæviæ*, permitted the vitiated secretions and offensive contents of the bowels to overload them, and remain pent up to be an additional source of irritation to their highly sensitive surfaces, and to the system at large. And yet, this is the doctrine so vaunted among us in the present day, and which threatens to become the popular theory of fever. So long, however, as the wretched, temporising practice which must result from it, is pursued, there will not be wanting abundant *post-mortem* proofs; that fever is nothing more than *gastro-enteritis*. If you would be enlightened physicians, and successful practitioners, you must take more general views than those which will lead you to look only at the internal coat of the stomach and bowels for the causes and phenomena of fevers.

But fever also shows itself in the muscular fibres of the vascular system. Not only the heart is in general excited to more frequent contractions, but the arteries also.—The natural standard of the pulse in the adult, in health, is seventy-three. You will recollect that the circulation differs at different ages—that in a new-born infant the pulse is about one hundred and forty—towards the end of the first year, about one hundred

* Upon the inspection of dead bodies, there has been repeatedly observed a remarkable turgescence of the vessels of the stomach and intestines, when the individual has died *suddenly*, without having ever manifested in life the least indication of disease in these organs. The vessels I have seen strongly injected even in cases of death from casualties occurring in perfect health

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and twenty-four—in the second year, one hundred and ten—in the third and fourth, ninety-six—at puberty, eighty—in manhood, seventy-three—at sixty, about sixty. Instead of seventy-three or seventy-five pulsations, they are quickened from that number to ninety, one hundred, one hundred and ten, one hundred and twenty in a minute—occasionally to one hundred and forty or one hundred and fifty strokes, depending upon the habit of body, the sensibility of the system, the type and character, as well as the cause of the fever, and the depletion the person may have undergone. This greater frequency of the circulation, though it does not take place in all instances, is generally present in fevers of the continued form; i. e. in the second or hot stage; but even then, it sometimes happens, that although all the other symptoms of fever may be present, the pulse, and in continued fevers too, is not more than seventy-three, the natural standard of health. Indeed in some cases, as before observed, Fordyce has seen it below seventy-three, yet all the other symptoms of the second stage of fever were present. From which it appears that the heart and vessels are in some cases not so much acted upon as the other parts of the body. So with yellow fever; the patient dies with black vomit, yet the pulse throughout is calm, soft, full and apparently healthy.

A pupil of mine, (Dr. Marx,) informs me that the same fact has been noticed by Dr. Glover of Charleston, S. C. in a patient of his who died with the yellow fever, that the pulse had been natural throughout his disease, and that Dr. Glover has related the case to the Medical Society of that city, noting this peculiarity.

This disease frequently operates, I had almost said exclusively upon the nervous system, affecting not only the brain but the nerves of the stomach, and other branches of the cæliac plexus. Indeed the stomach has been very properly denominated by Dr. Warren, of Barbadoes, the “seat and throne of the disease,” in yellow fever; for frequently other parts of the system remain relatively undisturbed. Even the muscles, in some cases, retain their power to the last moment of life! They are so little affected by the irritations of that fever, that I have known the patient to rise from his bed, dress himself, and walk about his chamber until his hearse was at his door, ready to receive his body. Such was his muscular power that he could dig his own grave!

Analogous peculiarities have been remarked in the plague and in the spotted fever: but they are not found as the attendants on fevers in general, as they rather constitute exceptions.

But to return to our subject. In the first stage, or the invasion of fever, the smaller arteries of the surface of the body are preternaturally contracted and diminished in their diameters. Less blood flows into them—the surface becomes pale; and with less blood there is also less heat; for heat is generally in proportion to the quantity of blood carried to a part—this fact we must all have witnessed. The hands, after riding in the cold air, and coming into a warm apartment, or suddenly exposing them to the intense heat of the fire, are not only attended with swelling but great increase of heat also, in proportion to such influx. So in fever the heat accumulates with the blood; and the quantity of blood being diminished in the first stage, the extremities are cold. This, it is to be observed, occurs much more frequently in fevers arising from marsh miasma, as intermittents or remittents; but less so in yellow fever; yet it is not unfrequently the case in small-pox, typhus fever, and the phlegmasiæ.

The exhalent, as well as the circulating arteries, are also excited to preternatural contraction; their extremities, in particular, are contracted or spasmodically affected. This is so frequently the case that Dr. Cullen considers spasm the cause of the fever. Is it not more probably the effect of the fever, or of the irritation producing fever, analogous to the small pulse in gastritis, enteritis or phrenitis, and other membranous inflammations, or inflammations seated in very sensible parts of the body?

Dr. Rush calls fever a convulsive action of the blood-vessels. This is but another expression to show the irritation which fever produces in this as well as other parts of the system. This stricture, spasm, or convulsed state, of the exhalent vessels, shows itself throughout the system in the excretions.

1. The saliva is diminished in quantity, and the mouth becomes parched and dry. The tongue, too, is dry; its papillæ are erected by the retraction and stricture which take place upon the intermediate parts; and usually is attended with great thirst.

2. The urine is limpid, pale, white, and diminished in quantity.

—the bladder, as well as the vessels of the kidneys, manifests the effect of this irritation by its contraction and disposition to evacuate itself frequently during the invasion of fever; and that irritation will produce this effect we have an illustration in the effects of hydrophobia. In a dissection made of a person who died of hydrophobia, by the late Dr. Andrew Marshall, of London; and by whom I was informed of the fact, in 1793-4; the urinary bladder was found preternaturally contracted. (See the same as related in his life, published by Mr. Sawyer, one of his pupils.) The same thing has been stated in accounts of other dissections, where death had been occasioned by that disease.

3. The skin is contracted in fevers—exhibiting the *cutis anserina*—the constriction is even manifest to the eye, like a muscle wrinkled as well as contracted—almost the same constriction is apparent in the human body as takes place in the skin of horses, which is supplied with a distinct muscle, the *panniculus carnosus*. Whenever that animal is diseased by fever, this muscle becomes affected, and the horse is said to be hide-bound. The skin, in fevers, also becomes dry and harsh, losing its natural softness, and no evaporation taking place, the circulation at the same time being increased, the heat of the body accumulates; for the fluid secreted by the skin in health being converted into vapour, necessarily takes off a portion of the body's heat. In this way cold is produced by evaporation. Upon the same principle the atmosphere is cooled on a hot day by a shower of rain—the heat or caloric being absorbed in the conversion of water into vapour—in the practice, too, of cooling liquors by moistening the bottles containing them, the heat of the liquor is communicated to the surrounding moisture, which it converts into vapour, leaving the contents of the bottle relatively cold. In this way the human body might be frozen in the month of July. Upon the same principle, perspiration going on, Sir Charles Blagden, Dr. Fordyce and others, were enabled to bear the extraordinary degree of heat (300° , 400°) to which they were exposed in their experiments; and which was great enough to broil beef-steaks, or to cook eggs. The use of the fan, instead of cooling them, burnt them by bringing a new stratum of hot air into contact with the surface of their bodies, which had been cooled by the abstraction of heat that took

place in converting the perspirable fluid into vapour. The want of this cooling process, therefore, as already observed, occasions our heat to accumulate, and thereby to become an additional source of febrile excitement.

4. The lungs, too, undergo a corresponding change in their functions. In phthisis we see expectoration diminished during the paroxysms of the hectic fever attendant upon that disease—in pneumonia the same thing occurs. We see the same in fevers in general.

5. The stomach, as is to be expected, manifests the evidences of the same irritation in loss of appetite—a morbid appetite—nausea, vomiting, suspension of the digestive process, as is evident from the food being long retained.—The gastric liquor is also probably both diminished in quantity and altered in its quality, analogous to the changes we see take place in the secretions of an ulcer. Hence it appears that intermittents and diseases of contagion are ushered in most generally by nausea and vomiting because they make strong impressions on the nervous system. The great semi-lunar ganglion and the numerous nerves of the stomach cannot escape the commotion produced by fever upon the nervous system.

6. The liver is no less affected than the stomach in the first stage of fever; but in the hot and sweating stages its secretions are oftentimes increased, showing this effect in a catharsis or increased evacuations; and those, too, exhibiting the appearance of bile recently secreted.

7. As to the pancreas, we have no evidence of such change, but the presumptive.

8. In the intestines the secretion of fluids is obviously diminished; hence costiveness is the usual attendant. The thinner fluids, that had been secreted, are also probably reabsorbed. Accordingly in the first stage of fevers the fæces are not liquid, but come away in a solid form, as we see upon giving an enema at this time. This is not all; it frequently happens that even after a cathartic or an enema, we find very unexpected discharges of scybala to take place, which had been long pent up probably by some irregular and partial contractions of the intestinal canal itself. This event frequently occurs in fevers; and especially in the advanced stage; oftentimes just before death, when such stricture may be removed by the universal

relaxation of the frame. In dysentery, where evacuations have not been sufficient in the first stage of the disease, such discharges frequently show themselves just before dissolution, and to the great reproach of the physician. In diseases of the intestines themselves, we know by dissection afterwards, that such stricture or preternatural contractions have taken place; and that lodgments of fæces have thus been formed. (See Baillie's Morbid Anatomy.) In fevers we also see this contraction by the small discharges that take place, and that the same irritation contracts the bowels that we know to affect the bladder.

9. Uterus. The menses are in like manner checked by fever, when they may have been flowing at the time of the patient's attack, and the lochia in puerperal fever are in the same way diminished. Indeed this diminution is among its first symptoms, and proves an additional source of malignancy in that peculiar form of fever that follows parturition.

10. The milk, too, is diminished, sometimes totally dried away; not only during the paroxysm, but frequently this agalactia remains after the fever has terminated.

11. Ulcers are dried up and their colour changed during the action of fever. Blisters become pale and cease to discharge—hence it is a bad symptom to see blisters rapidly healed—it being an evidence of the diminished secretion from the surface and the accumulation of great heat in the part.

12. The extremities also shrink—rings which before were tight now drop off. The wedding ring is frequently dropped on this occasion, and this by the superstitious is considered a bad omen.

The pulse also partakes of the changes going on in the system. In the first stage the pulse is small—it is small from another cause than the preternatural constriction of the artery; probably there is less blood to dilate it; i. e. the irritation, the cause of the disease, occasions the artery to contract upon less blood, and its contractions are more frequent—the heart and larger vessels consequently become in proportion full.

The pulse, I should here remark, is of different kinds; and conveys different sensations to the physician, which are expressed accordingly. I shall not amuse you with a recital of the numerous varieties of the pulse noticed by some nations, as

the Chinese, who count three thousand pulses: nor even the variety described by Dr. Rush.

I distinguish at the bedside ten varieties of pulse—

1. The full pulse, which dilates itself unrestrained.
 2. Small pulse, scarcely to be perceived.
 3. The soft pulse, readily yielding to pressure.
 4. Hard or chorded, terse, wiery or quilled pulse; i. e. not easily compressed, but making great resistance under the finger.
 5. The frequent or quick pulse, in which one pulsation rapidly succeeds to another. Some distinguish between the frequent or quick pulse, referring in the last to the quickness or jerk with which the artery contracts, and not the rapidity as it regards the number of pulsations. This is an useless distinction, for they both show the same irritation operating upon the heart and vessels.
 6. The slow pulse—one beat slowly succeeding to the other.
 7. The regular pulse—the intermission between the beats being the same.
 8. The irregular pulse—the intervals being irregular.
 9. The intermittent—where some pulsations are wanting—This is common in hydropic affections of the chest—also common in gastric and hepatic affections, and is more frequently symptomatic of those diseases than of any mal-organization of the heart or its valves—in angina pectoris—in organic affections of the heart, and also in nervous affections—palpitations.
 10. The gaseous pulse—giving the idea of air instead of blood filling the vessel—the soap-bubble pulse of Dr. Rush, as it was unfortunately called. The manner of feeling the pulse merits a moment's attention.
1. Do not feel the pulse too soon after you have entered the room. Allow the first impressions made upon your patient by the approach of a new object to subside.
 2. Let your patient's arm lie in an easy position, so that the pulse may not be excited by the action of the muscles, as would be the case in extending the arm to the physician.
 3. For the same reason, if your patient has just been getting out of bed, or has been moved in bed, wait for the subsidence of the effects of such movement.
 4. Do not exclusively confine yourselves to the pulse at the

wrist—sometimes the carotids or temporal arteries manifest the chief irritation of the disease.

5. In feeling the pulse, make use of two fingers instead of one—they correct each other's sensations—and as the fingers have nicer sensibility than the thumbs, the fingers are preferable for this operation.

It is a good rule, too, to feel the pulse in both arms—for frequently you meet with a great difference, particularly as it regards the size and strength of the artery.

6. This leads me to observe that for this purpose it will be important for you to cultivate a nice sense of feeling at the extremities of your fingers. This you will best do by the practice of wearing gloves—at the same time that you thereby preserve your hands at a proper temperature, so as thereby to ascertain the temperature of your patient. The physician need not frighten the women and children by wearing a muff, as was the practice of the elder Dr. Shippen, of Philadelphia, and of the elder Dr. Bard, of this city; but every physician should protect his fingers by wearing gloves, that their sensibility as well as their proper temperature may be preserved.

Upon many occasions, too, let me tell you, that you require all the sensibility you can command in the extremities of your fingers. You want it, in some instances, to detect the presence of pus when deep seated—or of water in the cavity of the belly—or in the ovarium. We also require a nice sense of touch in feeling a vein for the purposes of venesection, especially in young and fat children. The late Rev. Dr. McDonald, of Albany, came one hundred and sixty miles for the purpose of getting bled. The physicians of the town where he resided could not effect the operation. They could not perceive the vein under the stratum of fat that covered it. So in cases of croup it is very difficult, unless you are habituated to the sensation, to find a vein.

For these purposes then cultivate this sensibility—this knowledge at our fingers' ends is highly important—you will find it upon many occasions no less useful to the physician than to the surgeon. In the practice of midwifery, this nice touch is peculiarly necessary, not only in conducting labour, in ascertaining the presenting part of the child, and the dimensions and condition of the organs concerned, but in directing the

introduction of the catheter, which the accoucheur is frequently called upon to perform. Another good rule in feeling the pulse is, to concentrate our sensations in the fingers. This is done by closing the eyes, and thereby excluding impressions received by the other senses. Noise or even music, at our meals, we well know, impairs, if it does not destroy the sense of taste—so does a variety of objects upon the eye diminish and divert the sense of feeling. Noise in the bystanders, at an operation, frequently disturbs the operator. The cries of the patient have, upon some occasions, very much interfered with the sensations of the person performing an operation. I once, when operating for aneurism upon a lad, for a few moments found it difficult to feel even the pulsations of the femoral artery that I wished to detach, to put a ligature around it, until I could abstract myself by concentrating my sensations in my fingers.

I make but one remark more on this collateral, but certainly not unimportant matter. Never time the patient's pulse by a *watch*. It alarms, without communicating any information worth having. It may prove a *death-watch* to the sick!—But to return to the subject.

As fever advances to the second stage, the pulse becomes more frequent and tense, hard, chorded, communicating to the fingers a sense of sharpness, more especially when fever is attended with inflammation seated in sensible parts of the body, as the intestines; or with inflammation of the surface, as in erysipelas and other cutaneous diseases, and inflammation of the uterus, &c.; or of parts which become highly sensible when inflamed, as the dense membranes, the serous membranes, as Bichat calls them—such as the membranes of the chest—those of the liver, and those of the brain. The pulse manifests the irritation, not only by its frequency, but by its hardness, in the first and second stage.

It is an observation, as before remarked, made by Hippocrates, that sometimes while the arteries at the wrist are weak and small, the carotid and temporal arteries are strong, and the case is attended with coma; and in some cases by acute, deep-seated pain in the head. These dangerous symptoms, as remarked by Sir J. Pringle, in some cases denote inflammation of the brain, and abscesses are sometimes the consequence. Another observation worthy of your notice is, that the irritation

in the pulse is sometimes perceptible to the physician, while the patient is not conscious of any departure from a healthy state in his feelings. I have, in this way, oftentimes known in the morning, from the indication manifested by the state of the pulse, whether my patient would have a return of an intermittent, and have predicted it; while in other instances I have thus been enabled to prevent its recurrence.

LECTURE VI.

OF FEVERS IN GENERAL.

THE phenomena which have been noticed as the attendant symptoms of fever, appear not only in the paroxysm of an intermittent, but also in an ephamera, in synocha, typhus, the phlegmasiæ, and many eruptive diseases, as small-pox, measles, &c. They appear even in tetanus and in hydrophobia, when inducing fever by the irritation of the nerves, the primary seat of those diseases. For irritation, thus applied and continued, will produce fever. Not so, says Fordyce!—But we do see it even in tetanus and in hydrophobia.—See Dr. Rush's last publication on the hydrophobic state of fever, as he denominates it, in a letter which he did me the honour to address to me. Also, see Dr. Shoolbred's valuable paper on that subject, in which he relates some cases cured by treating it as fever, i. e. by venesection, and other depleting remedies. See *Med. Phil. Register—Eclectic Repertory of Philadelphia*. See also, Dr. Andrew Marshall's *Observations on Hydrophobia*, in which the effects of fever and inflammation are manifest in various parts of the system.

I refer you to these cases, not for the purpose of showing that they are necessarily febrile diseases, but that nervous irritation will extend itself to the blood-vessels by its continuance. Pain alone, if long continued, will also produce fever, as in cases of calculi of the gall bladder, kidneys, urinary bladder, the pain from spasm of the uterus, intestines, &c. The pains of labour are frequently attended with fever, which in some instances is of considerable duration. Indeed, in the process of labour you recognise the symptoms of a paroxysm of an

intermittent. The first irritations beget a chill; the hot and sweating stages succeed.

So far as irritation begets fever, we may say with Dr. Rush, that fever is unit; but assuredly the character and duration of the disease are changed, influenced, and varied by the causes producing it; and, as has already been pointed out, by the parts of the body becoming affected. I say, by the causes producing fever, and the structure and sensibility of the parts affected by such fever.

Thus, synocha arising from the sensible qualities of the atmosphere affecting the mucous membrane, produces catarrh, or cynanche tonsillaris; and these are afterwards frequently renewed by the consequent irritability of those parts upon the least change of dress, of air, or both combined. In this way we see some of the most alarming diseases induced. Our families in their attendance upon our dancing assemblies, by their sudden exposure at first to the air of hot rooms, and afterwards to the cool atmosphere, when heated by the violent exercise of dancing, and sometimes from other causes, with their bodies half naked, frequently thus ensure catarrh, hæmoptysis, and pulmonary consumption.

These causes first excite general fever; but pain and excitement in the irritable part are also among the first symptoms, the effects of such general fever upon the system.

In some persons the same synocha or general fever locates itself in the lungs, producing pneumonia. In others, the liver becomes affected, and hepatitis is produced.

The skin sometimes becomes the seat of irritation, producing erysipelas. Nothing is more common than these eruptive diseases at the approach of winter, in consequence of the check of perspiration and a general febrile state of the system; while in others it shows itself upon the muscles and joints, in the form of gout and rheumatism. Hence the common expression that the gout cures all other diseases, or takes the place of all others. If I could get a fit of the gout, says the free-liver, I should be a well man: that is, all his disagreeable feelings which affect him in different parts of the body, would be concentrated in his great toe. In other words, he would have one seat of irritation instead of many. In some again, the bowels are the irritable organs, and enteritis is the consequence.

In like manner the breasts, the uterus, or the lower extremities of lying-in women, are easily affected at the time of parturition, and inflammation of those parts of the body is frequently then produced by causes which, under other circumstances, would perhaps only occasion a slight indisposition or a common catarrh.

Accordingly, then, as the part is more or less irritable, either from its greater sensibility, natural or acquired, or from its previously having been the seat of disease, it becomes again the seat of irritation—the place of rendezvous.

A fellow student of mine at the University of Edinburgh, Decastro of Vienna, informed me that his mother had suffered twenty-one attacks of pleurisy, and ten of hives; and Dr. Ferdinand Ludlow, a student of mine, I am sure I attended for croup nearly as often: not a season passed until his twelfth year, that he had not several attacks of it, such was the irritability of his trachea and bronchiæ. Mr. T——P——l, jun., also, in his infancy suffered many attacks of croup, attended with symptoms of asthma. He now suffers bronchitis upon every exposure to cold.

Fever, therefore, varies in its character according to the causes producing it, and the condition of the part affected.

Let me here call your attention to the error of Fordyce, (p. 19, 20,) who makes those local inflammations the primary disease, instead of the effects of general fever occasioned by the sensible qualities of the atmosphere! He even considers phlegmon and sphacelus, as primary affections in diseases!—When occurring in fevers they certainly in many cases are not so. The bubo and carbuncle that appear in plague and yellow fever, although they appear early, are unquestionably the effect of general not local irritation, and that too in the first instance. So also the sore-throat in the commencement, and local inflammation or sphacelus which occasionally supervenes in typhus, are ascribable to the same general affection of the system. I have seen a case of an affection of the ankle joint in typhus fever prove fatal. I know another who is now suffering severe local disease proceeding from rheumatism, the effect of sea-bathing when heated by previous exercise. Hydrocephalus is also thus produced, in some instances, as the result of general fever. And you have seen in the present sea-

son, 1822, a case of fever ending in carbuncles, filled with purulent matter, and which in that case terminated fatally.

Riverius (see his *Prax. Med.* lib. 27. cap. 2. Appendix,) observes, that acute and dangerous fevers very rarely occur without producing some local congestion or inflammation of some of the viscera—"Rarissime fieri sine interna et peculiari visceris cujusdem affectione et plerumque inflammatione; quare nunquam omittenda cura hypochondriorum, capitis, thoracis, uteri, renum, et vesicæ; ut omni ratione investigamus quæ harum partium insigniter laboret, et ei, quoad fieri potest, subvenietur."

Dr. Donald Monro observes, that in fatal or malignant fevers, "the febrile matter is apt to fall on particular parts, and there to create abscesses, particularly in the brain, the lungs, and in the glands and organs." *Diseases of Military Hospitals*, vol. i. p. 237.

Affections of the brain are frequently noticed by authors as the consequences of general fever, as showing themselves in inflammation, in effusion of serum, or in suppuration, especially in the cerebrum, and indeed in the cerebellum occasionally. The cerebellum is said to be comparatively little affected. Two cases, however, of abscesses in the cerebellum are noticed by Pringle, as produced by remitting fever. Eisfield, in his account of the yellow fever of Leipsic, in 1799, mentions a case of abscess in the brain thus produced. In the epidemic fever of Geneva, in 1805, congestions of the brain were frequent occurrences. A similar condition of the organ was also observed by Jackson, to be the effect of yellow fever. And in examinations made in this country, this engorged state of the brain was also frequently observed, and occasionally a rupture of the vessels producing sudden death. There was a case at Bellevue, prescribed for by Dr. Bayley, in which the patient, apparently convalescent and sitting up in bed, suddenly fell back dead—an effusion of blood upon the brain was found upon dissection.

De Haen also mentions inflammation and sphacelus of the bowels as the frequent attendant on remitting fever, as discovered upon dissection. Pringle too states, that in northern climates rheumatism was an attendant upon intermitting fever. In 1822 and 1823, a case of this compound character occurred

in the New York Hospital, in which the intermittent and rheumatism appeared alternately. When the one appeared the other yielded—in this manner too, frequently changing places. In like manner fever, after exhibiting its idiopathic character, sometimes fastens on the lungs and terminates in pneumonic inflammation. Many years since a case of this nature occurred under the care of Dr. Richard Bayley. The disease began as an intermittent, and preserved its character a long time as such, but ended in pulmonary inflammation and ulcer of the lungs. A case of this nature was also presented in the hospital, in which it began as rheumatism, but in a little time manifested a tendency to phthisis; and another of an intermittent ending in a similar manner. Inflammation of the stomach is recorded by Bartholin, as attendant upon the remittent fever of Copenhagen. The same fact was noticed by Silvius de la Boe, in the epidemic of Leyden.

Fordyce even asserts that fever does not give a tendency to sphacelus, p. 21. Had he seen either of the cases I have already referred to, of the fever falling upon the ankle joint, or upon the knee, and ending in rheumatism and abscesses, he would probably have expressed himself differently on this subject; or had he seen the black man in the hospital in 1822, in whom the sacrum was laid bare by inflammation and ulcer supervening, in a typhoid remittent, he would have changed his views upon this important subject. Dr. Fordyce farther errs, when he says, that by removing the local inflammation, you remove the general fever. This is indeed taking a narrow, contracted view of the subject, not to observe the intervention of the whole system in producing the phlegmasiæ. I say, by removing the general febrile symptoms, you remove the local inflammation, unless it be far advanced towards the usual terminations of inflammation. But even then you moderate it; and again I assert, that the most effectual remedies are those which act on the whole system, and not upon the part affected.

Dr. Fordyce himself mentions, p. 24, a case of fever continuing and going through a long course of typhus, after pneumonic inflammation had been removed by venesection and other remedies. And he might have found many similar cases in practice. Therefore, I again say, remove the general

symptoms, and you will remove the local affections connected with them; but not vice versa, as he himself by this very case shows. For in this case, although the local disease was removed, the fever was not cured, but proceeded in its course even to the typhoid type. The doctrine I contend for, is farther confirmed by Dr. Fordyce's own observation, see p. 25, that general fever disappears and is entirely cured by the appearance of local disease;—whereas, upon his principle, the general fever should be increased instead of being diminished. But the contrary is the case. The general fever is very generally lessened by such local irritation, except for the time that such cause of irritation may be applied—during the action of a blister in a very sensitive system, the excitement is frequently very much augmented, but subsides in a short time. In like manner the local inflammation produced by mercury upon the salivary glands, frequently converts a general into a local disease. We observe the same fact upon the eruption of small-pox, measles, and chicken-pox, that the fever subsides upon the eruption taking place. So in like manner when eruptions spontaneously take place in diseases not of an eruptive character, the same relief is afforded. I know a young woman in whom an eruption appeared on the limbs, in all respects resembling the small-pox, as the attendant upon acute rheumatism, affording relief to the general symptoms. Another case occurred to me in a young child, in which an eruption appeared in the progress of a remitting fever. Eruptions of this nature occur frequently in various parts of the body, and generally afford relief. They appear about the mouth, the lips, the nose—from their salutary nature they are hence called critical eruptions. Not from any peculiar virus or humour that is thus discharged, as was formerly supposed to be the case, (my views of the humoral pathology, I trust, do not extend to this ridiculous extreme!) but from the local irritation they produce, translating the general irritation from the blood-vessels and other parts of the system. Upon the same principle, blisters remove instead of increasing general fever, and are accordingly oftentimes prescribed for this very purpose, and with the best effects. I therefore am inclined to believe, that synocha will beget the local phlegmasiæ, but that

the phlegmasiæ are not, as Fordyce and others suppose, the primary diseases, at least generally speaking.

At the same time, however, it is well known that local inflammation will sometimes produce general fever, especially when seated in very sensible parts of the body and in habits of great irritability of nerve, as in females and in children. A wound, a surgical operation, a blister, teething, generally produce fever. But it does not follow from this, that the phlegmasiæ are in general the primary diseases, because they may be so in some instances, and are so under peculiar circumstances. The physician of the Fever Institution, (see art. Fever. Rees,) observes, that in the advanced stage of fever, "inflammatory congestions are of not unfrequent occurrence, as in the stomach, lungs, intestines, and other organs," as already noticed by Riverius, who also has remarked, in most distinct terms, that we ought to recollect that all those fevers with which local inflammation is conjoined, are not symptomatic, but often idiopathic, and that the inflammation supervenes, not being the cause, but as the consequence of the fever,—"quæ febrem istam non afficit sed illi potius succedanea est." He adds, "we frequently observe in practice, that patients labour under continued fever for a day or two before pain of the side and other symptoms of pleurisy appear; thus also many persons, on the third or fourth day of fever, fall into inflammation of the brain, &c., "sic nobis frequenter in usu practico videre licet ægrotantes, ab initio febre continua laborantes per unam aut alteram diem, antequam dolor lateris et alia pleuritidis signa appereant; sic multi tertia vel quarta febris die in phrenitidem incidunt," &c. Riv. Prax. Med. lib. xvii. cap. 1.

Speaking of pneumonia, Dr. Cullen observes that pyrexia is frequently formed for some hours before the local symptoms become considerable, and particularly before the pain is felt. And Boerhaave has justly remarked, vol. v. p. 4—that pleurisy is rarely observed without a fever preceding it. So of the phlegmasiæ in general.

The second stage of fever now appears—no vis medicatrix is necessary to account for the phenomena which follow those of the first stage—no previous cold to beget the heat which succeeds. Attention to those symptoms will teach us that

there is but one continued, direct irritation, from the beginning to the end of fever, whatever may be its source. True—the spasmodic constriction of the smaller arteries, and especially of the exhalents, must necessarily, as I have already observed, accumulate the blood in the heart and larger vessels, including those of the brain, as well as of the chest. And this accumulation necessarily proves an additional stimulus in producing the excitement that succeeds, thereby adding to the fever; but which fever, as we have seen, already exists. The cold stage doubtless must be considered as an additional source of excitement or irritation. We see this frequently exemplified. We see it in a person immersed in a cold bath—he generally experiences soon after a temporary degree even of febrile heat—the hands and face after exposure to cold, glow with the increased action that succeeds.—And if the cold stage be induced by cold, such cold of itself becomes in some instances, even a direct source of irritation; I mean to say, that it is a direct stimulus—there is no truth in medicine in my opinion better established, that is, if it is the property of a stimulus to excite or to increase sensation and motion, than that cold is a direct stimulant or excitant. That a current of cold air will produce a glow on the cheek by exciting the action of the arteries, I think you will not dispute; nor I believe will you question the fact, that a lump of ice or a snowball, applied to the sensible parts of the body, will awaken a person from a sound sleep. Immersing the hand of a person sleeping in cold water, we know to have the effect of exciting even the distant bladder to contraction.

To return to our subject.—In consequence of the irritation so applied, the circulation accordingly becomes increased, and the pulse quickened; the skin becomes hot, dry, and glowing with blood, except when local determinations take place to the viscera, as in enteritis, and prevent or counteract the circulation to the surface. The cheeks especially, from their great sensibility, become florid during fever—the ears also show the same excitement—the eyes too become red—the serous vessels of the adnata being now enlarged from the impetus given to them, carry red blood instead of serum. At this time, hemorrhagies not unfrequently take place from the vessels of the nose, especially if the fever proceeds from a cause operating on the fluids,

as typhus. I have my three children at this time, in this very situation. The hands and feet also become hot and flushed—that is, the most sensible parts of the body become loaded with blood. In this respect a local, as well as a general fever, may be said to exist.

Sometimes, indeed, as before remarked, a local fever exists without a general febrile excitement, (as in the cases of White and Smith of Whitehall; enteritis is their disease, yet there is no pulse, or heat, or state of the tongue indicating their condition;) but this excitability of the system from local causes greatly depends on the constitutional sensibility of the nervous temperament. In some persons a common bile or whitlow, will beget a violent fever of the whole system.

Besides this excitement in the blood-vessels during the second stage of fever, the respiration also becomes hurried and anxious, in proportion as the blood is more or less rapidly conveyed to the lungs. The heat of the body, too, is in correspondence with the rapidity and irregularities of the circulation. The natural standard, as before observed, is 98° of Fah. or rather $97\frac{1}{2}$, to speak very accurately, the measure of heat being applied under the tongue. In this stage of fever it is increased even as high in some instances, according to Fordyce, as 105° . As I have already remarked, 110° or 112° have been noticed by authors, but their correctness becomes very questionable after the repeated, and, doubtless, accurate experiments of Drs. Fordyce and Currie. Perhaps the statement may be true of *scarlatina*, in which certainly the heat is more intense than in any other febrile affection. Dr. Willan says, that in that disease he has known it to be as high as 112° . Owing, too, to the partial determinations in the action of the blood-vessels, we also find the heat to show itself in some particular parts of the body more than in others. Thus one extremity of the patient is sometimes hot and of a florid colour, while another is cool and even pale. Senac states the same fact of a patient of his, who felt a coldness only in one arm. He also refers to another case, where the person had one side cold and the other hot, p. 25. As before observed, it is the effect of respiration to increase the heat of the body—the lungs are the fire-place; but it is the province of the circulation to distribute that heat: hence, accordingly, we find it directed to

particular parts, producing the effects which have been noticed.

It is also worthy of remark, that the heat of the body, now increased and accumulated, becomes a great additional source of irritation and fever; operating upon all the functions, vital, natural and animal.

The disturbance of the brain and nervous system now becomes increased by the additional irritation and excitement which has taken place, especially in the vascular system; and as in the first stage, so in the second, we perceive its effects in all the faculties of the mind; in the external senses, and the organs of motion—producing delirium—an increased confusion of thought—distressing dreams—insensibility to external objects—inability to distinguish them; and in some instances, a total alienation of mind, amounting to mania. It is also observed, that when the patient dies in this stage of disease, the brain is frequently found to exhibit the evidences of great congestion and inflammation.

The effects of the second stage are also manifest in the organs of secretion. The urine now becomes high-coloured, being hurried through the kidneys half formed, almost partaking of the blood from whence it has been so recently separated. The same observation applies to the bilious secretion, which is also increased in quantity in consequence of a similar rapidity of circulation through the liver, as we see by the immense discharges of bile—and bile, too, just secreted—which oftentimes are observed to take place when vomiting or diarrhœa is excited. In like manner, the small vessels upon the surface, and indeed in every part of the system, become highly injected, for they are acted upon by a very powerful engine, the heart and its larger vessels. But although this impetus be given to the vascular system, the exhalents are not completely unlocked in this stage of fever.

The absorbents partake of the same excitement that influences the exhalent vessels. They also are quickened in their operation, as appears by the rapid diminution of the flesh and fat of the body, which is the consequence of fever, as we see exemplified in the hectic fever attendant upon phthisis, in which the very nails become curved around the fingers, such is the irritation attendant upon that disease.

We see the same loss of flesh in typhus fever, and in the febrile irritation of pregnancy.

This increased excitement of the absorbent system also shows itself in the rapidity with which blisters are healed and disappear, owing not only to the strictured state of the exhalents, but to the excitement in the absorbents, which take up the effused fluid as fast as it is poured out. Hence, too, the use of blisters in dropsy.

The fluids of the intestines are in like manner rapidly carried away; and this is probably the first cause of that costiveness which is so invariably the attendant upon fever. Hence the scybala and hardened fæces which are afterwards created. For this reason it is important to procure early evacuations in fevers, as we thereby guard against a great additional source of febrile excitement, arising from the materials so absorbed. Thus, too, we account for the dry and parched state of the tongue, as partly occasioned by the thinner fluids being taken away, as well as by diminished exhalation. Hence the secretions of the mouth become viscid and clammy, adhering to the surface from which they are secreted, as after the excitement of the system occasioned by too much wine. The discharge from the salivary glands, in the same manner, becomes thickened and adhesive.

The fluid of anasarca swellings accumulates after fevers have terminated, from want of energy in the absorbents; but during the continuance of febrile action that fluid is sensibly diminished. Hence it is that febrile commotion, in whatever way excited, in many instances proves a cure for dropsy. Hence, too, the most active means that are prescribed in passive dropsy are such as produce a powerfully stimulant effect and excitement in the vascular system—mercury and squills—cantharides—horse-radish—mustard, and other stimulating ingredients, composing the fashionable diuretic decoctions. This accumulation in the blood-vessels makes evacuations more necessary, for by the neglect of them fever is aggravated, more especially by the reabsorption of the foul materials from the bowels. Not that it is necessary that such evacuations should be by venesection, but by the natural excretions of the body. Therefore not only retention of the noxious matters ordinarily evacuated, adds to the malignancy of fever, but an increase of

foul materials in the blood-vessels, carried thither from the intestines and other sources by the absorbents.

We should therefore also be prepared to expect from violent fever, or fever long continued, a vitiated state of the mass of circulating fluids, both from those materials which are retained as well as those which are absorbed from the intestinal canal and other sources. These various vessels of the system, having their action continued a certain time, at length the body becomes relaxed either by a remission or abatement, or by a total intermission of the symptoms of the disease, depending on the causes creating the irritation and the duration of those causes. In consequence of this general relaxation, the vessels on the external surface of the body become more patulous—the spasm, or stricture, or convulsion—call it what you please, ceases to exist, and the fluids are again discharged by the exhalents in the form of sweat. Hence this stage of fever is denominated the third or sweating stage of fever. This too is to be considered as the effect of indirect debility, as opposed to that which is the direct effect of weakness, as occurs in the last stage of fever or during convalescence.

The sweating stage may take place spontaneously, or it is the effect of art employed to relax and unlock the vessels of our system. When this stage has arrived, it displays itself in all the secretions and excretions—the excreting vessels of the tongue, mouth, fauces, and membrane lining the nose, all pour forth from their surfaces the fluids that had been pent up. Accordingly such discharges indicate a favourable change in the character of the complaint, and are an evidence that the irritation of the disease is subsiding.

In like manner the excretion from the lungs is restored by this general solution of fever, as we see in phthisis to take place at the termination of the paroxysms of the hectic form of fever attendant upon that disease: and in ordinary pneumonia, the same discharge by expectoration denotes the abatement of the general fever, as well as of the local inflammation, and hence constitutes one of the most favourable symptoms that can occur in pleurisy or peripneumony. The skin too, in the sweating stage of fever, changes its temperature not only as the effect of a diminished circulation at this period of fever, but as the consequence of evaporation and the absorption of

caloric by the conversion that takes place of the fluid discharging from the surface into vapour. The skin, I may remark, generally manifests this favourable change first about the forehead, and thence it becomes apparent over the other parts of the body.

In the excretion from the kidneys an analogous degree of relaxation is apparent—the urine, instead of being pale as in the commencement of fever, or of a high colour as in the second stage, now deposits a large sediment, and is of more consistence:—this sediment consists of the earthy and saline materials of the blood, which the emulgent and their exhaling terminations permit readily to pass in this relaxed condition of the system. This sediment, from its resemblance to brick-dust in its colour and character, is hence denominated the brick-dust or lateritious sediment, so called from later—lateris, a brick. After the fever of gout and other diseases attendant upon a full habit of body, this deposit is uniformly observed to be very abundant.

The discharge of bile from the liver, and of serous fluids into the intestinal canal, is in like manner restored, as we infer from the liquid stools and the bilious colour of them that sometimes take place in this stage of fever. Indeed, in some instances diarrhœa takes place at this period.

The uterus too experiences a degree of relaxation correspondent with the general condition of the system. The vessels of that viscus, which were surcharged in the second stage, now empty themselves by profuse menstruation—fluor albus reappears if it had been suspended—the lochia if suppressed are again restored. In some cases such is the determination to the uterine organs by fever, that the discharge amounts to hæmorrhage. Even clots I have known discharged under such circumstances, and from a person too, whose womb had never been called upon to perform other duties—contrary to the opinion of those who consider the menstrual discharge to be a peculiar secretion, and not possessing the properties of blood. This doctrine of the discharge from the womb being sanguineous I have long taught. I find it also to be the opinion of Sir E. Home, Cruikshank, Bichat, and others, as well as of Rhuysh, Hunter, and a host of others. The milk in a similar

manner is restored, and ulcers again secrete their natural and healthy fluids.

After the fever is terminated, if of short duration, the natural feelings are all revived—the various appetites return, and in some instances acquire new vigour. The snuffer returns to his box, the smoker to his cigar, and the seminal secretion and appetite among others, is perhaps preternaturally acted upon by the now greater sensibility of system. The wife too, in this season of convalescence and returning vigour, is now sometimes got with child that was never before pregnant. Such is the effect of the impulse that has been given to his system, that it becomes also a source of new impressions to the wife.

To proceed. The functions are all restored, mental and bodily. The vital, natural, and animal functions, except where the system is much debilitated by the long continuance of febrile action, as in typhus and other continued fevers; in which case the degree of debility is in proportion to the degree and duration of the existing irritation. But in this case, the debility not only shows itself in those parts of the system we have hitherto pointed out, it also displays itself in its effects upon the fluids of the system.

LECTURE VII.

OF FEVERS IN GENERAL.

BUT fever not only operates, 1st, upon the *nervous* system; 2d, it not only operates upon the *muscular* fibre, as it shows itself upon the larger muscles, upon the circulating, the exhalent, and the absorbing vessels; but it has also a third operation:—it acts upon the *fluids* of the system as well as upon the solids, more especially when the fever is of considerable duration and violence; and that too, whatever may be the character of that fever, whether belonging to the class of febres, the phlegmasiæ, or the cutanei.

Allow me here to protest against the prevailing disposition among the medical teachers and practitioners of this day, and which has existed from the days of Dr. Cullen, to trace the seat, origin, and proximate cause of disease to the nervous system exclusively, totally disregarding the condition of the fluids and the vessels from whence the brain and nerves derive their powers, and upon which they constantly depend for the performance of their functions.

When we look at the formation of the various parts of the body in the earliest stages of existence, we see the immediate dependence of vitality upon the globules of fluid circulating upon the part that may be the object of our examination. The fœtus in the womb holds connexion with the mother, not through the medium of nerves or by sympathy, but by means of the fluids that circulate through an insensible tube, in which the anatomist, with all the aids he can derive from his glass or his knife, has not hitherto discovered the least evidence of a nervous fibril. Yet through this very conveyance do we see

not only life and health, but numerous diseases of the mother communicated to her offspring.

In what does this change of the fluids consist? I call it a putrid or putrescent state.—What is putrefaction? I answer, it consists in a *decomposition* of the materials undergoing such process, and new chemical combinations or compounds taking the place of the materials so decomposed.

In this process the solids lose their cohesion—the fluids lose their combination, and are divided into more minute molecules, from which again new chemical compounds are formed.

In the ordinary process of putrefaction or decomposition too, there is usually an extrication of air towards the latter part of such process—that is, when such putrefactive process is completed; or in other words, some of the new products which are formed assume a gaseous or aeriform state. Not so, however, in all cases—for such extrication of air is not essential to the putrefactive process. Some say this extrication does not take place during life, and that the vital principle is the great antiseptic which counteracts the completion of the putrid stage:—but the vital principle being destroyed, surely that organization which is dependent upon it is destroyed. So it is during life: the vital principle being impaired, the organization is accordingly impaired. The vital principle partially destroyed, the organization becomes to the same extent destroyed or suspended. But in some cases it may be renewed by the regeneration of parts so destroyed—as after gangrene or sphacelus. As far, therefore, as the vital principle may be destroyed or lose its controlling influence, so far putrefaction may take place, even in the living body. But this will especially be the case in those parts of the body in which the vital principle has the least influence,—as in the fluids, which are certainly less dependent on the condition of the principle of life, than either the nervous or the moving fibre constituting the solids. Admit that the blood possesses vitality, (and some you know extend vitality to all the fluids of the body, not excepting the excretions,) I say, admit that the blood possesses the living principle, and it follows that in proportion as such power is impaired or destroyed, the fluids are liable to those changes they would undergo out of the body. But this tendency to the putrefactive process in any body, will also depend upon the number of articles making

up the compound. Out of the body, it is a fact established by chemists, that articles consisting but of one or two ingredients, as oils or resins, will not putrefy;—that this process requires an aggregation of materials. In like manner, if such condition exists in the fluids of the living body,—that is, that a great variety of materials be taken into the system, or those retained which are usually evacuated, or a new ferment be introduced, putrefaction may be expected when the vital principle is impaired and loses its controlling influence over those fluids.

It is of all things most strange, that Dr. Cullen and Dr. For-dyce, when describing the phenomena of fever, should have been so silent, at least so sparing in their observations on the effects which fever produces upon the fluids of the system;—for they both, upon other occasions, were compelled to admit, though involuntarily, the changes which we contend for. As practical physicians and as candid men, they could not pass by those changes which the fluids undergo in disease. Dr. Cullen in his *Nosology*, admits it in the following expression. See note to p. 72. “I suppose that the humours have a tendency to putridity in every typhus—but this only in different degrees—and a greater or less tendency to putridity only varies, but does not change the species.” “In omni typho humorum in putredinem proclivitatem adesse puto; sed vario tantum gradu adest, ita ut major minorve putredo speciem variare, nequaquam mutare, potest.” In his *Materia Medica*, vol. i. p. 62, 63, &c., in remarking upon the conversion of vegetable substances into the animal fluids, he says, that this conversion is best illustrated by the putrefactive process they undergo.

Again; after the animal fluids are so formed or perfected, he observes, “they do not long remain stationary, but are continually advancing towards a putrid state, and that these degenerated parts, i. e. putrescent materials, are constantly passing out of the body by the several excretions.” p. 63.

Speaking of the acrimony of the fluids, he says, “It is very possible it may be so;” and adds, “that upon many occasions it certainly is so.” p. 63.

Again he remarks: “To conclude, I will not deny that the state of the fluids may have a share in distinguishing the different states of the body both in health and in sickness—but at

the same time I must maintain, that we know little of the manner in which it may have this effect: that our theory of the human fluids is still very incomplete and imperfect." p. 65. In his *First Lines*, (Rotheram's edition, p. 45,) he says: "From the dissolved state of the blood, as it presents itself when drawn out of the veins, or as it appears from the red blood being disposed to be effused and run off by various outlets, and from several other symptoms, I have no doubt, how much soever it has been disputed by ingenious men, that a putrescency of the fluids, to a certain degree, does really take place in many cases of fever." p. 45. Again, speaking of the causes of fever, he admits in p. 49, "that they arise from a putrescent matter; that their production is favoured, and their power increased, by circumstances which favour putrefaction; and furthermore, that they often prove putrefactive ferments with respect to the animal fluids." In his cure of fevers, his third indication, too, is expressly formed upon the existence of this state;—for the object of it is "to obviate or correct the tendency of the fluids to putrefaction." The means of fulfilling this indication consists,—1st, in avoiding the new application of putrid or putrescent matter,—2d, in evacuating the putrid or putrescent matter that may already be present in the body,—and 3d, in correcting what may remain by means of fixed air and other antiseptics. p. 88. See also his observations on scurvy, diabetes, and hæmaturia, pp. 328, 466, 573, et sequel. Yet Dr. Cullen in his preface, speaking of the doctrines of his great predecessor Hoffman, observes, that they were disfigured by intermixing the humoral pathology!

The system of Boerhaave, too, he pronounces on this account to be fallacious, and apt to mislead—denominating the humoral pathology hypothetical. p. 17. But, as I have before observed to you, Dr. Cullen had powerful inducements to offer some new doctrines, whether ill or well founded. A strong current had been setting to Leyden. Boerhaave's merited celebrity must be counteracted. To do this a new standard must be raised: and as he expressed himself to Dr. John Gregory,—“a tub must be thrown out to amuse the whale.”*

From what has been said, it is evident that he possessed a

* See Gregory's Memorial.

perfect knowledge of the facts on this subject; but it is no less certain that he wanted candour to promulgate them—because, forsooth, they are calculated to overthrow the favourite fabric that he had erected. In concluding his preface, after stating his intention of extending the doctrines of Hoffman, founded on the nervous and moving power, he also observes, “that he avoids the hypothetical doctrines of the humoral pathology, which disfigured his and all the other systems which had hitherto prevailed,” and hopes to be excused for attempting a system which may appear new. p. 22. But Homer himself sometimes nods.

Fordyce, who is no less inconsistent, you will also find falling into a similar error on this subject, in his description of fever. Yet in page 117, he has this expression: “True, it appears not uncommonly that very evident appearances of putrefaction take place in fevers which are very infectious; yet in a great many fevers that are so, there are no appearances of putrefaction.” Here the admission is given very grudgingly, (yet it is given,) that the putrid state may exist during life, though he does not specify the fluids which may undergo such putrid process.

Armstrong, a bold writer, whose work on typhus fever, (third edition, p. 118,) has lately attracted the notice of the medical world as a work of great practical merit, thus expresses himself on the subject of the fluids as the seat of disease. “The humoral pathology no doubt abounded with absurdities, yet I am fully satisfied that there are several diseases to which it might in some degree be justly extended; and therefore believe that its almost entire abandonment has been prejudicial, by leading us from the investigation of various morbid states of the fluids, and of the means best fitted to correct them.” And then he applies his remarks to hæmorrhages and to petechiæ, as connected with a dissolved state of the blood. In like manner, some of the professors of the medical colleges of our own country have lately adopted the doctrines which have been taught in the New York school. I rejoice that these are, in general, the doctrines embodied in Dr. Eberle’s excellent system of practice, which has now become the popular text-book in therapeutics.*

* See also Gregory’s Practice, with Notes by Drs. Potter and Calhoun.

What, then, are the evidences of such condition of body existing in fever?

The fluids of the body become changed from their healthy state,—1st, by the causes of the disease. Fever occurs in such situations as are peculiarly favourable to such vitiated state of the fluids, as on ship-board, in hospitals, in camps, jails, &c., where the air becomes putrid and offensive. Fever has been produced by putrid animal substances,—as the putrid whale in Holland, spoken of by Forestus. Paræus, in his *Tract de Peste*, cap. iii., observes also, that in his time the same thing took place on the coast of Tuscany. Septic effluvia, from putrid animal bodies, constitute the chief causes of putrid fevers. Sir John Pringle mentions a fever of this kind in the camp hospital, which was caused by a person lying in one of the wards with a *mortified limb*, at a time when the weather was very hot, and the place very close and badly ventilated. He mentions the fact also of his having known a dysentery (which is nothing more nor less than a fever, and often a very putrid one too,) to be occasioned by experiments on *putrid blood*.

A fever of a most putrid sort was engendered from the putrefaction of cattle in the island of Nevis, from hides, &c., affecting the crew of a French ship, producing in the sick all those symptoms which are usually considered as indicative of such deranged or putrescent condition of the system, such as hæmorrhagies, purple spots, and carbuncles. Fevers are also recorded by Sir John Pringle, as the effects of the state of the air, induced by the putrefaction of dead bodies remaining unburied on the field of battle. See Pringle's *Dis. of the Army*, p. 321.

To these he adds, that the decomposition of vegetable substances producing miasma, also gives rise to intermitting and remitting fevers, the last of which especially frequently run on into the typhoid type of fever; while others arise from ferments of a contagious character, introduced either by exposure to the diseased body or by art—as small-pox, measles, plague, and even the yellow fever.

And in other instances again, we see fevers generated from the very condition of our system, independently of a *materia ab extrâ*—traceable to colluvies in the intestinal canal, the

effect of the excessive use of fish and other forms of animal diet—from putrid provisions, or from the contents of the bowels being rendered more than usually offensive and acrid from neglect—from the influence of season—change of climate, or other cause. Dysentery is thus not unfrequently lighted up in the individual, and afterwards, like typhus or yellow fever, assuming a contagious character, becomes communicable to others in a similar frame of body.

2dly. The fluids of the body become changed from their natural and healthy state by the retention of those materials which are, when in health, ordinarily passed off by the skin, the lungs, the kidneys, and the bowels. The nature of those materials, and their peculiar qualities, will be noticed in another place.

3dly. The fluids become changed by the absorption of the materials contained in the bowels, and these become more vitiated by the fermentative process which takes place in the stomach and small intestines when diseased, viz. the acetous fermentation; and by the putrefactive fermentation of those contents that succeed in the lower tract of the intestinal tube, more especially in hot climates and in hot seasons of the year. By neglecting to evacuate the bowels in the first stage of fevers, practitioners not only lose the advantage of removing an aggravating cause of fever, but they absolutely protract it into a very tedious disease, that otherwise would have been little more than an ephamera:—and frequently too they thereby convert a simple fever into one of a malignant character.

4thly. The fluids become changed by the reabsorption of the secreted fluids of the system; at the same time, perhaps, that the whole of those secreted fluids had already undergone some change, previously to their secretion, by the morbid condition of the system existing in fever, as we see to take place in the ulcerated surface, as in the bowels, and in the quality and properties of the urine, all of which vary according to the state of body at the time of such secretion.

The gelatin, the albumen, the fat, the saline materials of the body may be, and are probably thus reabsorbed, and contribute to those changes which are manifested in the circulating mass. Hence it is, that we see the blood in fevers exhibiting the buffy coat, that too of various characters; and frequently too in the

last stage of fevers, but not in the first. See Rush on Yellow Fever. Hence it happens, that in pregnancy the blood usually exhibits the buffy coat, owing probably to the absorption of the fat and other materials that are taken up, and produce the irritation so characteristic of the pregnant state.

I may here just remark, that it is favourable to this explanation, that the buffy coat consists of this compound, that it putrefies some hours sooner than the other parts of the blood, as has been ascertained by repeated experiments made by Sir John Pringle, as you will see in the valuable appendix to his work on the Diseases of the Army, p. 75. I shall notice this subject upon another occasion.

5thly. When diseases of this character occur, the body is under circumstances peculiarly favourable to such putrefactive process. The greater heat of climate and season in which such diseases are most prevalent, and the increased temperature of the body itself in fever, are calculated to favour this change.

What are the evidences we derive from the phenomena the body exhibits under such circumstances?

The streams depend upon the fountain. If the source be pure, so are the streams; but if the former be foul, so also will be the latter. The fluids manifest these changes in the *excretions* of the system.

As, 1st. In the urine, which becomes turbid, and oftentimes muddy, like beer. In some instances, again, it is bloody, resembling coffee-grounds. "I have seen," says Dr. Huxham, "several times the urine rendered almost quite black, depositing an immense quantity of matter, nearly of the colour of coffee-grounds." Similar cases of black urine may be found in the books.—Treatise on Fevers, p. 38. In other cases, again, the urine is foetid, and so acrid that it affects the bladder itself, exciting it to frequent evacuations. When you look at its saline ingredients, which are now so readily discharged, you are not surprised at the irritation it excites in the bladder.

2d. The intestinal discharges show this condition of the fluids. In this state of body the discharges from the bowels are frequently frothy, like yeast, thereby indicating the fermenting or putrefactive process. The materials, too, evacuated, are highly offensive and acrid, exciting the bowels even to tenesmus and

diarrhœa, a frequent occurrence in fevers of the typhoid character.

3d. The lungs, too, emit a peculiar effluvium, in fever, which is sometimes highly offensive, particularly in typhus; and indeed I may say, in the advanced stage of most fevers. It is to the acrid quality of the excretions from the surface of the lungs, in typhus fever, that we see that disease so uniformly attended with coughing. The tongue and the teeth also display this condition of the humours. The tongue is covered with a slimy, dirty, blackish matter. The gums are, in like manner, loaded with foul sordes, like that on the teeth. The lips partake of it; i. e. the secretions which take place about those parts are changed from their original and healthy state, analogous to similar changes in the other excretory organs of the body. A new and peculiar set of glands, situated in the gums, have recently been discovered to be the source of those peculiar secretions constituting the tartar on the teeth. The secretion from them no doubt adds to the offensiveness of the breath under these circumstances. At the same time, however, let me remark, that these symptoms are also attended with an impaired state of the vital powers in other respects, manifesting itself by hemorrhages, great depression of spirits, sighing, subsultus tendinum, &c.

4th. The skin also excretes an offensive discharge. Instead of the natural smell of the perspirable matter, its smell is similar to that of urine; at the same time that it is exceedingly acrid and irritating to the surface, and frequently attended with petechiæ and vibices.*

“Frequently,” says Armstrong, “they not only arise from increased arterial action, or from relaxation of the extreme vessels, but oftentimes from a dissolved state of the blood, which undoubtedly occurs in the last stage of many fevers.” He farthermore subjoins, that “petechiæ, from increased action, are of a bright red colour—from relaxation, generally of a darkish brown. From a dissolved state of the blood, they have an inky appearance, always accompanied with effusions of very dark blood from other parts of the body, as the nose, bladder, or in-

* See Richerand's Observations on Urinous Fever. See Armstrong on Typhus, p. 119.

testines." p. 119. Indeed he believes, from repeated reflection, that the cause of death is some peculiar change in the blood itself, rendering it unfit for the purposes of vitality. p. 117-18.

"Sometimes," says that minute, precise observer, Pringle, p. 313, "petechiæ are not seen till after death, i. e. after a still more complete decomposition; but they are also frequent in the advanced stage of fever. The complaints attendant upon miliary fever are in this way produced."

In the last stage of typhus, yellow fever, dysentery, and plague, these evidences of such change in the system are frequently met with. The eruptions, the blotches, and ecchymoma, of scurvy; the hemorrhages from the nose, gums, lips, ears, bowels and kidneys; the sphacelus from blisters, ulcers, and ichorous abscesses, all which occur in the advanced stages of fever, (as recorded by Lind, Pringle, and others,) are in this way only to be accounted for. The doctrines of Hoffman, Cullen, Brown, and others, who look exclusively to the nervous system for their principles of pathology, are very insufficient and unsatisfactory on this subject.

The putrid, offensive sweats, and the cadaverous smell of the whole body, are also indicative of this putrescent condition of body. The colour of the skin is changed even during life, in the same manner as we observe to take place after death; i. e. what occurs after the total extinction of the vital principle, to a manifest degree, takes place during its partial extinction in the state approaching dissolution. After death from yellow fever, or from the bilious remitting, and in some instances from typhus fever, the body becomes yellow, and of a brownish, tawny hue. A similar change is apparent in the advanced stage of those fevers, and announces their fatal termination. In like manner the skin changes its colour by poisons introduced into the system; such as laurel water, and the bite of a serpent, particularly about the parts bitten, as stated by Huxham. Some suppose the yellow colour that appears, to be produced by bile. This resort is not necessary. We see in dropsy, and especially in hydrocele, the serum effused to be frequently of the same yellow colour, when the liver has not manifested the least disease. Nor does the general aspect of the body exhibit the peculiar appearance of bile in those very cases in which such yellow serous effusions may have taken place. I some-

time since drew off from the vaginal sack, in a case of hydrocele, nearly a pint of serous fluid, as yellow as fresh bile, yet the patient was otherwise in health. Dr. Warren, in his account of the yellow fever of Barbadoes, offers the best explanation of the change of colour that takes place in that disease. He accounts for it as dependent on the state of the fluids, and especially of the serum, which becomes altered in its properties, as the effects of the poison in impairing or destroying the vital principle that he supposes to exist in the fluids of the system; analogous to the changes which the blood undergoes when effused or extravasated, when it is out of the reach of the vital principle, as in a part that has been bruised; or as we see it in an ecchymoma after venesection, or in the analogous effusions under the skin, attendant upon scurvy, in which a similar yellowish colour of the part is produced. We have a familiar example of the same appearance in a bruise of the eye, vulgarly called a black eye. The small vessels are broken, and the blood diffuses itself throughout the whole loose texture of the eyelids that are affected.

Sir J. Pringle, in his Experiments upon the serum, Appendix, p. 79, observes: "We are not always to ascribe this to inflammation, but to a solution of some of the red globules, mixed with the serum; for the serum is tinged with a small quantity of red blood when putrefied." In the very sanguine complexion, the skin is yellow; in the dark, swarthy sailor, the red disappearing, the body assumes a dark nut-brown. It is not improbable, too, that the numerous sebaceous glands of the skin may have their secretions changed, which may aid in producing those changes of colour which the skin undergoes from febrile disease. The appearances after death, we know, instantly bespeak this change of the system. After death from fevers, that have been of long continuance, and have been attended with the malignant symptoms referred to, a rapid decomposition immediately ensues—much more so than after death from any other diseases. This change, this decomposition or putrefactive process, I assert, must necessarily have begun before death. But where do these evidences of dissolution or decomposition first appear? I answer, in those parts of the body where fluids abound, viz. the brain, the eyes, nose, mouth, throat, abdomen, stomach, intestines, uterine organs,

&c. This fact is observable in every dissecting-room. It was long since noticed and recorded by Dr. Hunter and others, as you will perceive upon consulting the appendix to the work of Sir John Pringle, in which you will find Dr. William Hunter's letter to Sir John Pringle, stating his observations made in the dissecting-room.—I add, it is in consequence of this rapid decomposition in the more fluid parts of the body, that anatomists, in dissecting the body, always begin with the brain, as decomposition soon takes place there, rendering it soft, destroying its texture, and confounding the various organs and tissues of which it is composed. They next proceed to the abdomen, and so on to the other cavities, where fluids abound; and in the fluids, as before observed, the putrefactive process takes place more rapidly than it does in the relatively solid muscular fibre, which for many weeks remains unaltered, for the anatomist to pursue his dissections and demonstrations.

But appearances, before death, no less indicate the commencement of the decomposition or putrefactive process, than that we observe so instantaneously to follow dissolution. The same state which has been described as the attendant upon the total extinction of life, is no less apparent before death, viz. the distended state of the abdomen, constituting tympanites.* The blotches on the belly, the offensive effluvia from the excretions, the cadaverous smell of the body, all indicate the same condition that succeeds to the total extinction of life. In the case of a lady who died of scarlet fever, six months advanced in pregnancy, there was, during life, tympanites; and an offensive, cadaverous smell, and discolourations of the belly took place before death. She, herself, became conscious of the cadaverous odour emitted from her own person; for in this case the intellectual faculties and the senses were relatively undisturbed. In fifteen minutes after death the air of the room, and indeed of the adjoining apartments, became so intolerably offensive, that it was necessary to employ artificial means to purify the atmosphere, as recommended by Guyton de Morveau and

* This distention of the belly is doubtless owing to the extrication of air from the decomposition of the fluids contained in the cavity of the belly, as well as those more immediately contained in the intestinal canal, and which we see so sensibly to increase immediately after death.

Carmichael Smyth. In such cases, after death, the body is only to be preserved by artificial means, as immersing it in spirits, enclosing it in a tarred sheet, covering it in oil, or washing it with the acetous or pyroligneous acid, the application of powdered charcoal, covering it with ice, or other means of controlling decomposition. Another evidence of such decomposition or putrefaction is derived from the fact noticed by Baron Percy, (see *Journal of Science and the Arts*, No. 23, p. 180,) that wounds in a malignant state have been known to manifest the same phosphorescent appearance, the same emission of light, that is known to take place from organized bodies when putrefaction takes place, as from putrid meat. But these are not all; many other cases I have witnessed, in which this tympanites and change of colour took place. In ordinary cases we see the pulse to cease in the extremities, which become cold and relatively dead. Blistered surfaces, too, evince the loss of the vital principle, by the dark and black appearance which they frequently assume. Ulcerations, from whatever cause, exhibit, at this stage of disease, the same change. Even before death, and in cases, too, where the patient recovers, it is not unusual to observe this partial loss of the vital principle, when at least its operations are suspended. It ceases to have control over the extremities of the body; the pulse ceases; the hair drops out; the feet become insensible, and relatively dead, and perhaps remain so for weeks after general recovery.

The remedies that are necessary to counteract this vitiated state of body bespeak its putrid condition. Stimulants, tonics, but especially that class of remedies denominated antiseptics, are in a peculiar manner called for in this condition of the system. We use acids, fixed air in yeast, (see Dobson on Fixed Air,) sudorifics, serpentaria, and particularly the acescent vegetables—and such means only can restore the body to its natural healthy state. (See an excellent note on the subject of the fluids in Lewis's Translation of Cullen's Nosology, p. 147, art. *Tabes*. Cabanis, p. 130.)

LECTURE VIII.

OF FEVERS IN GENERAL, AND THE EVIDENCES OF A VITIATED
CONDITION OF THE FLUIDS.

BUT we are not limited to the facts which have been enumerated. We have others that furnish the evidence of such a putrescent state of the body actually existing—proofs that the blood itself circulating in our vessels, undergoes a change approaching to this process, as well as the fluids secreted from it. Fernelius, one of the most respectable authorities in medicine, (see Cabanis, p. 130,) and who is always spoken of as a philosopher as well as a physician, and in terms of the highest approbation, in his work on Fever, chap. vi., expressly states, that the blood drawn in putrid fevers (for the ancients always divided fevers into putrid and non-putrid,) is not only fœtid, but that it has arrived at that condition that it will not coagulate, its fibrous texture being destroyed by decomposition or putrefaction.—“Sanguis qui per febres putridas detrahitur sæpe animadvertitur non solum fœtidus et graveolens, sed et putridus; adeo ut nec sibi cohærere nec concreescere queat, omnibus scilicet ejus fibris putredini consumptis.” Fernel. de Febr. cap. v.

Morton, another celebrated physician, in his Pyretologia, states the case of the blood drawn from a female in malignant fever, being so offensive that it not only greatly annoyed the operator, but was perceptible to the bystanders. The same author (see Prolegomena, p. 26,) observes, that in petechial fever the blood when drawn emits a fœtor as well as the urine. Swenk-kius (see Hæmatologia, p. 90,) also states, that in putrid diseases, and especially in plague, the blood is found in a putrid state. Pringle remarks, “that besides numberless observa-

tions of the corruption of most of the secretions as well as the excretions in diseases, we have frequent instances of the tawny colour of the serum, the resolution of the crassamentum, and even of the offensive smell of the blood recently drawn." Huxham, in his work on fevers, (chap. v.) in a chapter expressly written on the dissolved and putrid state of the blood, states many facts corroborative of this condition existing even during life—not only as manifesting itself in the discharges which take place from the body, but by the sensible properties and changes wrought in the blood itself. See Cleg-horn, p. 101.

In the "General Considerations" prefixed to Bichat's "General Anatomy," is the following passage:* "I cannot forbear relating a fact, which contradicts all that has been lately advanced relative to the incorruptibility of the blood in diseases. Engaged a short time ago in opening a body at the Hotel Dieu, with MM. Peborde, L'Herminier, and Courder, I found, instead of the black blood that is common to the abdomen, a sanious grayish fluid, which filled all the divisions of the splenic vein, the trunks of the vena porta and its hepatic branches, so that, on cutting the liver in slices, we could perceive, by the oozing out of this matter, the various ramifications of the vena porta and vena cava, which contained common blood. The body was so remarkable for its obesity, that I do not recollect ever having seen one like it. This state of fluid certainly did not proceed from the effects of dissolution; so that the blood must have been, while circulating, if not vitiated to this degree, at least very different from its natural state, and absolutely decomposed."

The reason why we do not so often meet with this state of the blood as might be expected, doubtless is, that we so rarely draw blood from the body in the advanced stage of fevers.

Physiologists consider the blood not only to be kept from putrefaction by the vital principle, but also by its constant motion; as the constant movement of running water and the agitation of the sea preserve rivers and the ocean pure. Motion, in these last cases, certainly serves to exhale both from sea and river water its most putrid particles.

* Vide p. 41.—London edition, 1824.

At the same time that its movements interrupt to a degree the fermentative process that otherwise would take place; for rest is necessary to fermentation, and so far such motion controls its putrefaction; but when it ceases to flow in the distant vessels, this preservative power is diminished or lost.

So secretion and excretion convey out the noxious materials from our system, and new materials take their place: but when those noxious excretions are retained, and these new materials are withheld, the effects are very soon perceived. Dr. Lind remarks, that he has always observed that the Romish clergy, who are in the habit of frequent fasting, become scorbutic, and remarkable for a fœtid and offensive breath. He asks, "Can we ascribe this sudden effect of fasting to a disorganization in the solids? Is it not more consonant to the laws of the economy, that the blood, being deprived of regular supplies of mild and nutritious chyle, should be first affected by this loss, and that the solids suffer in a secondary way only?" Lind on Scurvy, p. 328. But, independently of the fresh supplies of chyle, these secretions being stopped, the putrefactive process soon succeeds. So with the ocean itself—in calms of any duration, it soon becomes highly offensive, and its surface is covered with the results of such putrid process. After three days' calm in the month of August, 1794, I witnessed this fact on the Atlantic Ocean. The sea for miles around us was covered with a scum that became exceedingly offensive, (the heat at the same time being great,) and very soon after our whole crew and passengers became sick with typhus fever. A similar fact I have met with either in Cook, Clark, or Humboldt, Silliman, or some other voyager equally respectable, though I cannot now verify the authority. The moderate motion of the sea, therefore, does not of itself prevent that process from taking place even in the waters of the ocean.

So it goes on to a certain extent in the blood-vessels. We see fermentation, (for we have no better term by which to designate the assimilating process which takes place in fevers,) I say, we see fermentation in small-pox, in measles, in the yellow fever, in jail fever, and in plague, and indeed in all diseases arising from contagion. We even see this fermentative or assimilating process in various parts of the body. We see it in the processes of secretion and assimilation going on

in the intestines, in the lacteals, in the blood-vessels. We see it in all the secreting and excreting vessels. What are these but decompositions and new chemical combinations? Putrefaction is an analogous process. I know no distinction between fermentation and putrefaction. Indeed, fermentation is denominated in this stage the putrefactive fermentation, to distinguish it from the first stages of the same process, the vinous and acetous fermentations. Sir John Pringle used to observe, "That from the Greeks down to the present time, medicine was a science in which there was a great deal of reasoning upon a small number of facts;" and justly adds, "that in future, on the contrary, there ought to be little reasoning upon a great number of facts." Upon the subject before us, there has been a great deal of discussion, (especially since the fashionable rejection of the humoral pathology,) but these speculations I trust, must yield to the numerous facts which we have now assembled, and which all lead irresistibly to the conclusion, that a putrescent state of the fluids occasionally takes place *even in the living system*.

Such at least is the conclusion I draw from them. But whatever may be the speculations we indulge, however unsatisfactory may be our explanation of the phenomena which have been enumerated, the facts themselves can never be invalidated relative to such change, let that change be called by whatever name. And, as subservient to practice, they are all important; for without giving attention to the use of those means that are peculiarly calculated to resist this putrescent or vitiated condition of the fluids, we shall prescribe in vain.

Dr. Cullen, the great but inconsistent opponent of the humoral pathology, admits that the bark is of no importance in the cure of scurvy,—that this is not merely a disease of debility, but of a peculiar vice of the system, to be otherwise corrected. In like manner, in the cases related to you in my clinical lectures of the scurvy and scorbutic eruptions which prevailed in the state prison, we might have gone on to the end of time with mercury and sulphur, without curing the disease, which ripe acescent fruits and other vegetable antiseptics, immediately effected. So in fevers of the typhoid type.

It is uniformly urged as an objection to this doctrine, that if putrefaction existed in the blood, air must be extricated, and

consequently the texture of the vessels must be immediately destroyed. Putrefaction, as I said before, is fermentation, i. e. decomposition, or a change in the compounds and new combinations formed out of the same materials.

In the processes of chyfication and the formation of blood—in the assimilation of that blood to the purposes for which it is destined, we have such decompositions and new compounds formed without the extrication of air. But we see actual fermentation or change go on without the extrication of air. We see it in every bottle of wine, however carefully it may be sealed, (for the ripening of wine is no other process.) And, as Walker observes, we see it in the living body in small-pox, the multiplication of which in the body he calls a fermentative process, and in which Dr. Cullen concurs.

Dr. Cullen in his *First Lines*, (vol. v. p. 597,) says, “It is evident that the contagion of small-pox acts as a ferment with respect to the human fluids, and assimilates a great part of them to its own nature.” Cruikshank, one of the most enlightened of our profession, also expresses the same opinion still more amply. (See Dyckman’s *Pathology of the Human Fluids*, p. 185.) This species of fermentation is hence called silent fermentation, as having some laws peculiar to itself; as opposed to that which takes place in the open air or under other circumstances. But, allowing for a moment that air should be extricated in the blood-vessels, I ask, must it necessarily prove fatal? I say yes, if it be suddenly introduced into the blood-vessels, and in large quantities. So of pus, and indeed water, in large quantities. Even blood itself in transfusion, if suddenly introduced, proves immediately fatal. See an excellent paper by John Hunter, on the inflammation of the veins after venesection, in the *Chirurgical Transactions*, vol. i. Yet pus taken gradually into the system by absorption, is not immediately fatal, and perhaps not so at all. But it produces a peculiar form of fever called hectic fever; and this, I believe, is the only way in which hectic fever is ever formed. I have never seen a hectic fever but from this cause. Remember the peculiar characters of hectic fever. It is not every waste of the body from weakness, but much more, as its name imports. It comes from the Greek word *ἥξις*, which signifies a habit.

Some, by the by, contend that hectic fever is formed without the presence of pus in the blood-vessels; and they will give you as an example a caries of the bone, or a diseased joint, as attended with such fever, and yet without pus. Is this so? Is there no absorption of matter? I ask what is a caries of the bone but an ulcer of the bone? And where is the ulcer without secretion? Where is the ulcer without matter? And what is this matter but pus? True, the pus of bone is one thing in appearance, the pus of flesh is another—yet both are nevertheless pus, and will produce all the effects of pus in the blood-vessels. Although the muscular fibre of fish is different from that of other animals, they are muscular fibre; although, as the scripture tells us, the flesh of fish is one, and the flesh of birds is another, they are nevertheless flesh. So the pus of bone may have some appearances differing from that of the soft parts; it is nevertheless pus. To return from this digression.—The experiments of Redi, and other eminent naturalists, show that air, like pus, may be conveyed into the veins slowly and in small quantities, without killing the animal. "*Pauco aere injecto neque necatis animalibus.*"—Redi, vol. iv. p. 223. See also Pringle, Ap. p. 89.

But this part of the subject may now be put at rest, since the observations of Mr. Home and Mr. Bauer, lately published in the Philosophical Transactions, showing the presence of air circulating in our vessels, and that the very qualities of that air have been ascertained, viz. fixed air, given out in coagulation. p. 463.

But we do not contend for absolute putrefaction in the living body, while influenced by, and under the control of, the vital principle; or say that it proceeds to the same extent that takes place after death; but that so far as the vital principle is destroyed in the part, or in the whole system, so far putrefaction may take place during the life of the body.

But do we see this grade of putrefaction, this commencement of the process, exhibited by experiments out of the body? Yes we do.—See Pringle's experiments on flesh and upon blood. Before air was extricated in such quantity as to be perceptible, putrefaction began. The specific gravity of the material, the subject of the experiments, was changed; the substance floated before such air could at all be detected by the senses;

yet a separation, to a certain extent, had taken place between the integrant parts of the substance undergoing such change.

Similar decomposition may certainly take place in the living body, especially in the blood and other fluids, in which there is less of the vital principle, and where it exercises less control than in the solids. And it is farther to be observed, that from the experiments of Sir John Pringle, and of Dr. Hales, (See *Veg. Static.* ch. vi.) that much more air is extricated from putrid flesh than from putrid blood. The same quantity of air, therefore, is not to be expected from such changes in the fluids as would be looked for from the decomposition of the solids; the fluids would be much more advanced in the putrescent state before they exhibited this evidence of such change.

But while silent fermentation can exist in other bodies, so also may that silent form of putrefaction, that putrescent grade, take place in the less vital parts even of the living system; for all the chemical changes which occur in the body are assuredly controlled, and more or less modified, by the influence of the vital principle. Hence, therefore, it is certainly possible that a degree of the putrefactive process may take place during life, in as far as the vital principle itself is impaired, and its controlling power diminished. It is even possible that putrefaction itself may have some peculiarities—some limits in the living body, which it has not after death, under different circumstances. Without admitting this result in a certain extent, as before remarked, we cannot possibly in any way account for the rapid decomposition which so instantaneously takes place after dissolution, as well as many other facts which have been noticed.

Whatever may be our reasonings or our speculations, our facts themselves must stand uncontradicted. We may cloud them in words, or obscure them by sophistry; they are nevertheless the same; and so far the humoral pathology must be received.

But fever, in the last stage of disease, is not confined to these effects upon the fluids; the solids also become, in turn, affected by their reaction. As the heat that is accumulated by fever becomes in turn a new and additional source of excitement, so the fluids, being vitiated in the manner that has been stated, become a new source of irritation and of exhaustion to the

nervous and moving fibre—a sort of secondary fever, as it may be called, ensues.

In the last stage, the typhoid state of fever, now to be noticed, the solids, I observe, are in turn reacted upon by the fluids, which have become vitiated. Such vitiation is produced by long-continued action—whether the fever in which it occurs be induced by cold; by marsh effluvia; by human effluvia; or the materies morbi of diseases acknowledged by all to be contagious, as small-pox, measles, scarlatina, &c. We occasionally see cases of pleurisy from cold, exhibiting a similar malignancy.

Rheumatism, in 1797, prevailed in New York to a great degree, and exhibited a great tendency to assume the typhoid type, in which venesection was injurious. Analogous cases are noticed by Sydenham, as influenced by peculiarity of season, state of the air, &c.

Intermittent fevers, from marsh effluvia, in some cases run into that type; and are especially malignant on alternate days—particularly those fevers occurring in the heat of summer, or in hot climates—thence they readily become continued and contagious, as noticed by Cleghorn, in Minorca, and by Russel, in his history of Aleppo. See also Senac. And on the same account remittents still more frequently terminate in typhus, as they are a nearer approach to the uninterrupted or continued form of fever. Even hectic fever, I believe, would become so, if regular intermissions did not occur to counteract the putrescent tendency, by the sweat and other natural secretions and excretions being restored. In small-pox too, that is, in natural small-pox, which is generally the confluent form of it, there is always a secondary fever, from the reabsorption of the matter from the surface; and this secondary fever, very generally, assumes the typhoid type. Measles also, in some cases, exhibit the evidences of putrescency.—See Watson's account of what he denominates putrid measles, in the London Observations and Inquiries—see also Willan's *Rubeola Nigra*.

I witnessed several cases of typhoid measles in 1795, in New York, particularly in a family that had recently arrived from the West Indies, and probably with their systems more or less influenced and changed by the heat of the climate they had

left. It assumed a malignancy which I have observed but once since that period. I saw another case in the hospital in 1819, during the prevalence of typhus in the same ward.

In scarlatina this condition of body is also of very common occurrence. In a family in this city, it was a very fatal disease; and it will ever be so if active measures be not taken to guard against this condition of body, and attention be not paid to the different stages of that disease, which you will find very much neglected even by the best practical writers. Dr. Heberden himself, distinguished as he is for his practical observations, does not appear to recognise these different stages.

In like manner, the ferment of concentrated human effluvia produces this typhoid form of fever, and is propagated by contagion. This is perhaps the only idiopathic form of typhus fever; the others being symptomatic of long-continued excitement.

I call jail, camp, or ship fever, idiopathic, because the disease has a tendency to assume that character, notwithstanding all the exertions that may be made to counteract this tendency. The predisposition is in the previous state of the fluids. I call the poison or taint communicated by jail and other fevers, of a contagious nature, a ferment, because it acts as such upon the circulating fluids. That "a little leaven leaveneth the whole lump," is as true in fevers as in making bread, or in the conversion of acescent fluids into the acetous acid—and that upon the same principle of assimilation. That one spoiled herring will taint the whole cask, is well known to every housewife or fish-monger; hence the great care of the Dutch in their herring fisheries to salt down their fish as soon as they are taken. They never permit the sun to rise upon them. Sir John Pringle's experiments with an egg, a living body, illustrates this principle very happily. The same assimilating process I believe to take place in small-pox, in syphilis, and other diseases which are universally admitted to be contagious diseases. It is called by Walker, the assimilating fermentation. The same process, I believe, takes place in fevers; and that the peculiar taint formed by the excretions of the system reproduces in others precisely the same disease, whether it be dysentery, yellow fever, plague, ship or jail fever.

Hewson, the celebrated anatomist, died of typhus fever, induced by a wound received in dissecting a diseased body: the poison conveyed proved a ferment and source of morbid excitement to the whole system. During the winter of 1827-8, a fatal and much to be lamented case, of a similar nature, occurred within these walls, in which such local irritation was followed by an excitement that appeared in every part of the system; at first operating upon the stomach, intestines and brain; and thence diffusing its deadly effects throughout the frame. Numerous cases of fatal fevers have been produced in London and Edinburgh by this cause, among the young men attending the dissecting rooms. But in some instances, such poison vents its force upon a single gland, producing perhaps a bubo in the axilla, as in the case of my own brother.

We see, then, two distinct causes of this typhoid state of body. 1. A worn-out state of the excitement; and, 2. A ferment introduced. But the first is of itself sufficient in fevers to induce this derangement of the whole system, without the last, by wasting the nervous energy and that of the moving fibre; and thence the impaired state of the functions of circulation and excretion which succeeds.

I do not, however, mean that merely a long-continued action, if it did not operate by its effects on the secretions, would of itself create typhus; (that alone would produce symptoms of simple debility, a worn-out state of the nervous system and the muscular fibre, as manifested in the impaired strength of the body;) but that it also acts on those vessels of the system upon which the state of our fluids depends. I mean the secreting, excreting, and absorbent systems of vessels.

This typhous state of body is accordingly sometimes manifested, as before observed, in pleurisy, or in an intermitting fever; but in those fevers arising from contagion or putrid ferments, added to the materials already existing in our circulating fluids, typhus is more readily produced; sooner manifests itself in the progress of the fever by depression, sighing, and other affections, denoting an impaired state of the nervous system; and more rapidly proves fatal, as in yellow fever, plague, spotted fever, than it is when generated under the circumstances before stated. This vitiated state of the fluids, combined with

debility, constitutes the typhoid type of fever : hence then, we see two classes of symptoms manifested in cases of this nature. First, those which are ascribable to an exhausted state of the nervous and muscular powers ; and, secondly, those depending upon the condition of the circulating and the secreted fluids. So that this debility appears in all the functions of the system, the vital, natural and animal.

LECTURE IX.

THE TYPHOID STATE OF FEVER.

WE observed yesterday, the typhoid state of fever to be made up of two classes of symptoms.

1st. Such as are referable to an exhausted state of the general excitement—that is, independently of any change in the condition of the fluids or of the system in any other respects.

And, 2dly. Those symptoms which arise from a deranged state of the fluids, as manifesting themselves both in the circulating and secreted fluids.

This impaired state of the nervous system shows itself in all the functions both of the mind and body. It appears in the imagination; it discovers itself in an impaired state of the judgment; in the reasoning faculty, and in the memory. We see it in the imagination or perception of things, which is generally false at this advanced period of fever. The sick man imagines things which have no existence. The external senses, too, are impaired. He sees supposed objects constantly before him. He now exhibits a perfect pseudoblepsis imaginaria, analogous to that state of the brain which is induced by spirituous liquors; or similar to that state of mind which is intoxicated by passion or deranged by the consciousness of crime or guilt; as Macbeth, when about to commit murder, sees the air-drawn dagger, which, in his eyes, is so palpable, that he draws it from its scabbard.

In fever, sometimes, those objects appear to him in one shape—then in another;—he sees men—flies, (hence called *muscæ volitantes*.) So strong is the impression that he catches at them—he rises up in bed, in pursuit of them; in some instances his fears are excited, and he endeavours to fly from them. His

ears are no less affected in the sense of hearing;—in some instances the sensibility is so great that the patient is disturbed by the very pulsations of the arteries; in other cases the nerves of the ear, like those of the eye, are acted upon by imaginary impressions, the effect of the creative power which they acquire in this diseased state of the nervous system—well denominated *paracusis imaginaria*, similar to that sometimes attendant upon *dyspepsia*. In like manner, the patient, in fever, hears drums beating to battle—or a person calling him,—he hears the bell toll—he sees his coffin—they are about to take him off for burial—he springs up—gets out of bed—wishes to go out—conceits himself not at home—(he wants to go home;) and, if not prevented, runs into the street, or leaps from a window. He is unconscious of his family and friends—talks incoherently—mutters to himself—is with great difficulty controlled—ten thousand thoughts rush upon his mind in rapid succession—every pulse almost brings with it a new impression; so sensitive is the condition of his brain, with regard to internal impressions. Not so to external ones; to these he is comparatively insensible; and sometimes altogether unconscious of what is passing around him; but by loud speaking he is roused from this reverie, and for a moment is perhaps consistent; but his mind is instantly disturbed again by the same phantasms, and he relapses into the same maniacal delirium as before. During this condition of body, and which perhaps continues for several days and nights, especially if mismanaged by the physician, he is constantly watchful; or if he sleeps, he is in continued agitation: you see it in every muscle of his body—his cheeks—his lips—his eyes—(they are all in motion)—his extremities also are in continual change from place to place; and each muscle in exercise. A *subsultus tendinum*, or an irregular action of the muscles, as in *chorea*, pervades his frame; if he awakes, he awakes confused—or is roused by a distressing dream—or perhaps imagines himself upon a precipice, or falling from a great height. The memory, too, like the other faculties of the mind, is also affected, not only during the continuance of fever, but even long after recovery. This I experienced after *scarlatina*, in 1801—my memory was impaired for six weeks after my recovery. On that occasion I was obliged to carry a memorandum of my patients, and of my

prescriptions for their complaints. In other fevers again, as in the plague and yellow fever, the animal functions, as they appear in the senses and in the muscular organs, sometimes remain undisturbed to the last of life. In those cases the disease appears to vent itself upon the fluids of the body; or upon some particular organ, as the stomach or liver. In all these cases the patients consider themselves well at the very moment that their graves are prepared for them, and the hearse is waiting at the door for their dissolution. This is not an imaginary picture, but drawn from the facts which have come within my own knowledge. For the most part, these walking cases, as they have been very properly called, are fatal cases. I have seen, however, two exceptions; and strange to tell, both grog drinkers; yet both recovered. The one was the late Mr. J. H.—he was thought by his physician, Dr. Tillary, to be dying—his skin was yellow—he had a violent hiccup, and was far advanced in the disease—he got hold of his can, and soon drowned the fever. Met by a friend, he cried out, “I have killed it—I have killed it.” He was a man of fine talents, and of a finished education, received under Beattie and Campbell, in Scotland. But he became intemperate, and sunk so low as to be a wanderer in our streets. The second case was that of a Mr. T. I found him sitting on the floor, with a blanket about him, and his mug of stiff brandy and water at his side. He accosted me thus: “There is my physician, Doctor, I shall live or die by it.” He too recovered. I lately treated a case of typhus fever upon the same principle—of preserving the excitement of the system by brandy. Finding that, in health, my patient had been in habits of indulgence in the use of spirituous drinks, the indication was apparent to adjust the degree of stimulus to the condition which the previous habit had produced.

In other fevers, again, the patient is affected by stupor or coma, at this period of the disease, instead of the irritations of the brain which have been mentioned. For the most part, coma or stupor appears late in the disease. The jaw falls; the mouth remains open; and symptoms of apoplexy ensue. Stupor, however, in this stage, does not arise from an active fulness of the vessels, but from a worn-out excitement of the brain, which in some cases shows its loss of power by this torpor, or from diminished action in the absorbents, or in retarded circulation of

the venous system of vessels; and hence patients frequently recover without the usual consequence of apoplexy, from pressure produced by an overloaded state of the vessels, from increased arterial action of the brain—as Dr. Bard justly observes, “They sleep away their disease.” But, in some cases, this stupor appears very early in the disease, from accidental determinations to the brain, or effusion taking place from the exhalents. The brain, in such case, soon becomes so engorged, that if it is not instantly relieved, an apoplexy follows. This mode of attack constitutes the *congestive typhus* of authors. Frequently, in fevers, partial determinations of this sort take place, owing to peculiarity of temperament; and perhaps original make of brain, as well as the pursuits of the patient, when in health. Hence literary characters soon become delirious in fevers, whatever may be their type; and in every stage of them, the first, as well as the last. With regard to delirium, too, it is important to distinguish between that which arises from the first or inflammatory stage of fever, and that which occurs in the advanced stage. This may generally be known by the duration of the disease—the evacuations the patient has undergone—the degree of abstinence which has been observed—the causes of the disease; but more especially by the accompanying symptoms, such as the state of the circulation, the pulse, heat, respiration, and the state of the secretions and excretions.

It is important to ascertain the character, nature and origin of the delirium, because this knowledge must be the guide of our practice.

For example:—Delirium in the first stage, as it proceeds from an active current of blood to the brain, calls for one class of remedies, such as are calculated to diminish excitement. While that of the last, requires a treatment totally opposite; to excite the system by tonics, and the most powerful and diffusible stimuli. In this stage of the disease the pulse is small, frequent, and oftentimes irregular. The circulation being rapid, the respiration is also in proportion hurried and irregular, attended with frequent sighing and sense of oppression. The heat is also in correspondence with the quickened action of the heart and lungs. The blood, I told you, is the vehicle of heat—but the fluids themselves are now changed in their condition;

you have not merely heat, but a modification of heat, derived probably from the quality of the fluids that convey it. It is accordingly intense, and of that peculiar sort that leaves an impression on the hand of the physician. The French call it "*chaleur d'acrimonie*." Wright calls it a *biting heat*. The same has been noticed by Huxham, Dr. Moore, and most practical writers. Dr. Frank describes it as "*acer, digitosque urens*," comparing it to the impression produced by the stinging nettle, the *urtica urens*:—while others again, compare it, with more propriety, to the sensation excited by hartshorn applied to the hand or other sensible parts of the body. This sensation appears to arise more from the peculiarly acrid nature of the discharges from the surface, in the advanced stage of fevers, than from the mere temperature of the body—for that effect is sometimes noticed when the heat itself is moderate—and it appears chiefly in those fevers which are of a contagious nature, as in jail fever, cynanche maligna, yellow fever, scarlatina, and dysentery. Pringle has noticed it particularly in the last mentioned disease.

This typhoid stage of fever shows itself in the secretions and excretions. The tongue, on this occasion, as in the preceding stages of fever, shows the condition of the system in this respect.

I should here first remark, that the tongue, upon being put out, manifests the same tremor and loss of power that is exhibited in the hand, or in other muscles of the body; but the patient sometimes is incapable of putting it out, though he understands you when you request him to show it; and if he has strength to put it out, such is the state of his mind, that he perhaps keeps it out until you direct him to withdraw it. In this stage of fever, you now find the tongue of various colours; sometimes of a dark crimson red, and perhaps effusing blood from its edges. In other instances black, and even coated with a dark, dry crust—in others, of a dark brown, with a black line along the middle of it; and occasionally I have seen it exhibiting even a greenish hue. But we must except from this description the plague and yellow fever, in both of which diseases the tongue is frequently clean and moist throughout the whole progress of the disease.

The tongue too, at the same time, will perhaps be found ulcerated, having aphthæ, which also are of different colours, whitish, brown, ash coloured, and occasionally almost black. These aphthæ or ulcers frequently extend to the gums, cheeks, and fauces; and for the most part are fatal symptoms, especially in dysentery. The breath is also highly offensive. The urine is muddy like beer, depositing a heavy cloud of mucilage and earthy matter. The stools are acrid and frequent, and exceedingly fœtid. The skin is hot and dry:—or, if moist, a slimy sweat appears to cover it, attended with petechiæ, small spots resembling flea bites or the sting of mosquitos; and these sometimes, says Huxham, are of a dun colour: and according to Armstrong, in some instances they are black, resembling ink. Vibices, like the appearances left after the strokes of a whip, effusions of blood, and extensive discolorations, also appear at this period of fever.

This vitiated state of body, showing itself in the state of the fluids as before intimated, may exist even without fever or the waste of the nervous excitement, as in scurvy, and the disease hence denominated petechiæ sine febre, the effects of a bad diet. See Adair, and the Edinburgh Journal.

In the Medical Repository, vol. ii. p. 147, you will see a case of scurvy produced by the excessive use of hickory nuts. According to Beddoes, scurvy is owing to the want of oxygen. Hickory nuts we know to consist chiefly of oil, that is, of hydrogen and carbon. Upon these the child was fed for three or four weeks. The consequence was, as perfect a case of scurvy as is produced at sea by the exclusive use of animal food. It was cured by the use of fresh acescent vegetables. The author of that communication proceeds to remark most justly, that the humoral pathology is too much neglected.

In typhus fevers, not only the fluids are affected, but this vitiation is conjoined with a general expenditure of the excitement of the solids. In this state too, as I have already remarked, the vitiated fluids create a new fever in the system, a secondary fever. The excretion from the lungs is also changed in this stage. Instead of the natural sputa, the mucus becomes viscid and glassy, with great loss of power in the muscles to expectorate it; especially if the lungs have been the seat of irritation, as in peripneumony. In some instances the dis-

charges from the lungs are dark coloured. The disease proceeding, the lungs become insensible to the effused fluids, until they may be collected in considerable quantities, when a violent exertion is made to unload them of the matter oppressing them. The patient now becomes totally unconscious of external objects. This is not all: he is also insensible to those events which are ever going on in the system itself. He passes his stools and his urine involuntarily, taking no cognisance of them. The discharges themselves are changed in their quality, as well as poured out in an inordinate quantity. Diarrhœa, at this stage of the disease, is a very common occurrence, and generally proves fatal. A great flux of humours is sometimes at this period suddenly poured into the intestines, which as suddenly destroys the patient. I have recently seen a fatal case, in which destructive diarrhœa was induced by the use of porter, given in this irritable state of the intestines.

The urine, too, is passed in considerable quantities, and sometimes of a dark colour, resembling broken blood or coffee-grounds. In other cases the bladder becomes insensible, though full of water; and is so much distended, that it is incapable of the contraction necessary to evacuate it—yet it proves a source of irritation to the patient, though he is unconscious of it. The catamenia also, at this period, in some cases become excessive, attended with a disposition to hæmorrhage from almost every vessel of the body. Thus we see at this period, hæmorrhages to take place from the nose, the gums, the ears, the lungs, tinging the expectoration, and even the saliva. Similar effusions of blood take place from the stomach and the liver, in the form of black vomit; from the intestines, the kidneys, and the bladder, resembling worms,—the blood taking the shape of the ureters or urethra through which it passes. In like manner, blood flows from the surface of blisters and of ulcers: veins too, that have been opened in the beginning of the disease, now bleed afresh; wounds that had been long closed (for twenty or thirty years, says Huxham,) are opened anew. Even the sweat itself, is also occasionally stated, in some malignant cases, to be tinged or coloured by blood poured out from the relaxed vessels of the surface. This is certainly not surprising, after the ecchymoma or effusion under the skin, which we have noticed. Of the blood drawn in malignant

fevers, we have already spoken very largely, viz. its fœtor, its dissolved state, the rapidity with which it runs into putrefaction. The disease advancing, the sweats become profuse, clammy, and cold. The evaporation is so great, and the powers of life so quickly diminishing, that the whole body rapidly loses its temperature, especially the extremities, viz. the hands, feet, legs, nose, and the ears. The same loss of contractile power existing in the vessels upon the different surfaces of the body, (I mean both the internal and external surfaces,) and the power of the absorbents being at the same time impaired, the fluids are consequently effused, and accumulated in most of the cavities of the body; as in the ventricles of the brain, producing stupor; in the chest, creating an additional source of laborious respiration; in the pericardium, showing itself in an oppressed state of the heart, and an irregular action of that viscus. In the abdomen also, large collections of water have been sometimes found. And in the last stage of fever, such effusion has occasionally produced hydrocele. I have seen such a case myself.

The eyes now become insensible to their natural stimulus, the light—they remain half closed, the patient winking very rarely. The thinner fluids become evaporated, leaving a glassy and viscid matter covering the balls of the eyes. The eyes at the same time remaining open, the vulgar suppose, as they express it, that the “strings of the eyes are broken.” And as far as it regards the power of the muscles of the eyes to close them, they are right, for that power is now destroyed. The sense of hearing too is lost—for the patient is roused with the greatest difficulty. The taste and sense of feeling are also destroyed or greatly impaired. The lungs partake of the same insensibility—the fluids effused in the bronchiæ and upon the cells of the lungs, collect in considerable quantity. Hence, the air passing and repassing through this fluid thus accumulated, occasions a rattling noise; respiration becomes irregular, with a total inability to expectorate. The power of the muscles is also destroyed. The patient is unable to swallow—the muscles of the pharynx and œsophagus partaking of this inability, and losing their contractile power, the smaller vessels cease to beat; the circulation in the smaller distant vessels ceases to be performed, or is not to be perceived; the sphincters of the

anus and bladder are totally relaxed ; every exhalent vessel loses its contractile power. But this loss of tone is not confined to the muscular fibre, showing itself in the various systems of vessels ; but also in the organs of voluntary motion. The limbs sometimes become palsied ; a constant twitching or sub-sultus of the tendons and muscles takes place ; and occasionally general convulsions. And these, when they occur in the last stage of fever, are for the most part instantly fatal. But where the exhaustion does not show itself in this extreme, the debility is still manifest. The body slides down to the lower part of the bed, owing to the action of the flexor muscles, which retain their power of action a much longer time than the extensors. Hence old men have their bodies bent forward. The same thing is observed with debauchees, who, by their mode of life, induce a premature old age. You will read a very interesting chapter on this subject by Richerand, in his *Physiology*. He has given a very lucid account of the predominance of the flexors over the extensors, as displaying itself in great exhaustion of the system, and immediately before dissolution. Upon the same principle, in this advanced state of fever, when about to prove fatal, the limbs are bent, the thighs on the body, and the legs on the thighs, as in sleep, but the patient lying on his back. Hence this itself is an unfavourable symptom, (as well as the flexed state of the limbs, and the action of the flexors in dragging the patient from the upper to the lower part of the bed,) for it shows the incapacity of the muscles for the exertion necessary to sustain the body on the side, which is always done by the action of the muscles. I have known an exception, however, in a gentleman of this city. The patient died lying on his side, owing probably to a paralysis of one side of his body.

The position of the patient in sickness should be constantly attended to by the physician, as it leads to important inferences. Accordingly, Hippocrates observes that “ the physician should find his patient lying upon his side, with his neck, his arms, and his legs a little bent, and his whole body in an easy posture ; for persons in health generally lie in that manner ;” and adds, that “ if the patient cannot maintain his situation, and is apt to slide to the foot of the bed, it is a most alarming sign.” *Prognostics*, sec. i. *Aph.* 14, 16. Remember, then, that

the flexor muscles are the first to live and move, and the last to die,—as is seen exemplified in the fœtus in utero, and the patient in death.

The muscles of voluntary motion belonging to the face become relaxed. The natural expression of countenance being impaired in connexion with the emaciation that now takes place, produces that change which is denominated the *facies Hippocratica*, from the admirable description given of it by Hippocrates in his Prognostics.* At this time, too, we often-times see in the patient a likeness to his relations, which in health was never observed—that is, it shows itself in the less changeable parts of the body, the bones, though not in the soft parts, which now have nearly disappeared in the emaciation that has been induced.

The countenance, like the limbs, becomes of a livid pale colour, owing to the blood collecting about the heart, especially the right side of the heart—its force in throwing it to the extremities being diminished. The cheeks become hollow; the nose pinched; the nostrils dilate at every inspiration; and death soon terminates even these imperfect efforts of the vital functions. After death, the body being examined, we find a variety of appearances which indicate the injury which particular parts may have sustained in the tumult and violence of the fever the patient has suffered. Sanious effusions are sometimes found in various cavities, as in the brain, in the chest, in the belly, and occasionally in the cellular membrane of the extremities. Where the patient does not die from typhus, dropsy accordingly is not an uncommon consequence or sequela of the disease. Sometimes too, purulent collections are met with in the brain, as noticed by Pringle. Similar collections also appear in the liver and the lungs, particularly where a predisposition existed to those last mentioned diseases, especially to phthisis. Inflammation, or an engorged state of the vessels of the brain or stomach; sphacelus of the latter organ and of the intestines, as in yellow fever and spotted fever, are sometimes discovered after death. This last mentioned fever, I

* See the Prognostics and Crises of Hippocrates, translated from the Greek, with critical and explanatory notes, by Dr. Ducachet, a graduate of this University. p. 15.

may just remark, is denominated in the Medical Repository the *new* fever; whereas, it is the old-fashioned petechial fever of authors, and is well described both by the ancients and moderns. A part of its virulence has doubtless been created by the improper stimulant treatment pursued in it. To this source of excitement too, probably many of the appearances found after death in spotted fever may be ascribed.

Such are the general symptoms of fever, and which we have seen to manifest itself,

1st. By the irritation it excites in the brain and nervous system, affecting the mind as well as the body.

2d. In the excitement it produces in the muscular fibre, showing itself not only in the muscles of voluntary motion, but also in the heart and arteries, in the exhalent and secreting vessels, not only expending the power of those vessels, but vitiating their functions, and thereby changing the quality of the materials they secrete.

3d. In the absorbent system of vessels, embracing not only the lacteals, but the absorbents of the different surfaces and cavities of the body.

4th. Its effects upon the fluids of the body; and

5th. The subsequent operation of the fluids thus vitiated upon the system, in exciting fever *de novo*, producing the typhoid form of fever, and this terminating in debility, putrescency and death.

LECTURE X.

THE CAUSES OF FEVER.—PREDISPOSING AND EXCITING CAUSES.

HAVING taken a general view of the phenomena of fever, as it affects the various parts of the system, we are now led to inquire what are the causes from whence these phenomena proceed? It is to be observed that physicians, when treating of diseases, make use of the term cause with great latitude of meaning, and in a sense sometimes very different from its ordinary acceptation in the writings of philosophers. It is therefore necessary for us to know the several medical applications of it, or at least those which are in most frequent use.

The causes of fever are very properly divided into *remote* and *proximate* causes. By *remote* causes they understand such as are comparatively less nearly connected with the disease, though they are the agents in the production of it; whereas the *proximate* are essentially and immediately so. They are indeed so inseparably connected with the disease, that they constitute the very condition or manner of its existence.

The *proximate* cause is that—"Quæ præsens morbum facit, sublata tollit, mutata mutat"—which being present, the disease is present; which taken away, the disease is removed; and which being changed, the nature and character of the disease becomes changed. Hence this distinction has been made between the *remote* and *proximate* causes.

The *remote* causes are again subdivided into two kinds, denominated *predisposing* and *exciting* causes. What then are *predisposing* causes? They are such as prepare the body, or render it more fit to be acted upon, by those agents which more immediately excite the disease. In other words, they ren-

der it more combustible, while the exciting cause, the torch, lights the fire. Let us illustrate this subject by a few examples. In the production of a cholera morbus, we see these various causes exemplified—a debilitated, irritable state of the stomach and intestines, is the predisposing cause; an indigestible meal, as an oyster supper, is the exciting cause. These, again, produce irritation, which, by inviting a great determination of bilious and other fluids into the intestinal canal, constitute the proximate cause. In irritable bowels, a glass of cider will induce cholera or diarrhœa. Or in the debility induced by fever, porter will sometimes induce a catharsis, as in the case mentioned to you yesterday.

2d. In the production of a common pleurisy, a peculiar frame of the chest, or irritability of the part, the consequence of a former attack, is the predisposing cause. Cold, heat, intemperance, or violent exercise, may be the exciting cause. Irritation in the pleura, producing a determination of blood to that part, and inflammation of that membrane, is the proximate cause of all those symptoms that make up the disease.

3d. The convulsions of children furnish another example. Their sensibility of frame, at that period of life, or a peculiar nervous temperament, constitutes the predisposition; while worms, teething, variolous matter, or other causes of fever, are the exciting causes: but the proximate consists in the irritation so produced in the bowels, in the gums, or in the blood-vessels, as small-pox or measles, for either of these will produce convulsions.

4th. Intermitting fever.—Debility from a former attack, or from other diseases, is perhaps the predisposing cause—marsh effluvia, the exciting cause—irritation of the nervous, and hence of the arterial system, constituting the proximate. Or perhaps marsh effluvia may be the predisposing cause. While cold, or heat, as by riding in the sun, or an indigestible meal, may be the exciting cause—yet the irritation which either of these may excite, is the proximate: not debility, which is an effect instead of being the cause.

The predisposing causes, for the most part, are internal—inherent in the system, and appertaining to it, as the various temperaments of body. This predisposition, however, is not in all instances essentially necessary to the operation of the ex-

citing causes. The body may or may not be debilitated; yet the exciting cause may operate, and disease nevertheless be produced. Nor is it indispensably necessary that the predisposition be inherent in the system, though generally this is the case, as in the example above mentioned, where marsh effluvia are the predisposing causes,—in these it is an external agent.

The exciting causes, again, are for the most part external, but not always so. When seated in the intestinal canal, as worms, indigestion, biliary calculi; a peculiar condition of the fluids, as lithiasis; or an hereditary taint, as scrofula or syphilis, they are internal, yet they are exciting causes. The exciting causes, too, are by some called the *occasional* causes, because they may or may not be present: but this is a bad term, as it is not appropriate; for the predisposing causes are also sometimes occasional causes.

I might go on to illustrate this subject by numerous other examples, as gout, apoplexy, &c. in which this distinction between the predisposing causes and those more immediately exciting the disease, is very obvious. It is highly important for us to ascertain the remote causes of disease, inasmuch as this knowledge enables us very often to prevent diseases, and sometimes to cure them. For instance: to remove from marsh miasma on both accounts, both to cure the disease and to prevent its return. In what then does the *proximate* cause consist, and what is it? It is that state of the system, or of the part, not only in which the disease resides, but which keeps up the disease—which present, causes the disease; which being changed, changes the disease; and which, taken away, removes the disease. Our knowledge of the proximate cause, therefore, is derived from the structure and functions of the part or of the whole system, which is the seat of the disease, of the remote causes, and the effects they produce. From these, and from these only, are derived the great general principles upon which we proceed in the cure of diseases. And until we have a correct and definite knowledge of the proximate, as well as of the remote causes, we shall never understand the cure of diseases upon principle:—until then, we shall indeed be mere empirics; for the proximate cause is correctly defined by the late Dr. Gregory, and by Gaubius, and by Celsus before him, in the language I have already quoted.

Let me give you a few examples.—Dropsy, in some cases, arises from increased exhalation, the result of fulness and inordinate excitement of the arterial system: while in other instances it proceeds from a debilitated state of the arteries, the veins and absorbents; i. e. the return of blood to the heart is retarded, and connected with it there is a diminished power in the absorbent system. Thus, then, dropsy arises from two opposite causes, and is of two kinds, sthenic and asthenic. The first occurs, perhaps, in a sanguine temperament, which is therefore the predisposing cause;—intemperance, or other cause, producing plethora, is the exciting cause. In that case, increased action of the exhalents becomes the proximate cause. Here, then, you perceive, very clearly, the distinction between the proximate cause and the disease itself:—and we remove the disease by the means of diminishing such plethora and such increased exhalation.

Again, the same disease, dropsy, arises from other circumstances. It perhaps occurs in a phlegmatic temperament, or in feeble old age, as the predisposing cause. The patient has had a fever of some duration, which has left a debilitated state of body, particularly a loss of tone in the nervous system, and of the absorbents, which debility of the blood-vessels and of the absorbents constitutes, in this case, the proximate cause of the disease. This debility, as I have said before, may even exist in the smaller distant vessels of the arterial system, as well as the nervous and absorbent system of vessels. In either case, this debility constitutes the proximate cause; to counteract which, will effect the cure. Stimulants and tonics, the reverse of the means employed in the former case, are now our only resource. A second example that may be adduced, is nephralgia, or spasm of the kidneys. Plethora is frequently the predisposing cause of such an attack;—cold feet the exciting;—irritation in the part, the proximate cause. Our knowledge of the part, of the state of the whole system, and our knowledge of the causes, direct our remedies.

In hystericalgia, plethora is the predisposing, excessive venery the exciting, irritation of the nerves the proximate. Lithiasis, or calculus, is another example. Here the predisposing, exciting, and proximate, are all united. The patient comes into the world with a redundant quantity of the lithic acid. It ac-

accumulates in his kidneys and bladder from his mode of living, the free use of wine, &c.; and thus becomes the proximate, as well as the remote cause.

So in gout—a sanguine temperament and free living predispose the body to this disease. Cold is the exciting cause. A determination to the extremity affected, producing inflammation in the great toe, becomes the proximate cause of the disease.

In all of these diseases, our knowledge of the causes alone directs our prescriptions.

The structure of the part, or of the whole system, the seat of the disease, therefore, must be known, as well as the cause or causes from whence it proceeds, to know the remedies which will be indicated. A few remarks upon each of these classes of the causes of fever will be necessary in this place.

Predisposition, we observe, is sometimes hereditary, and sometimes acquired. It is hereditary in the different temperaments, as the sanguineous, the melancholic, the nervous, and the phlegmatic. The sanguineous predisposes to fever and the phlegmasiæ;—the melancholic, to dyspepsia, hypochondriasis, &c.;—the nervous, to convulsions, hysteria, and other diseases of the class neuroses: while the phlegmatic temperament is peculiarly predisposed to dropsy, and other diseases of direct debility, as already noticed.

The first of these temperaments, the sanguineous, is more especially predisposed to fevers and febrile diseases; accordingly, this temperament stands at the head of the list of the predisposing causes of fever, and of the phlegmasiæ.

Plethora, in like manner, is frequently the predisposing cause of fever, as in the northern man, in the hot latitudes of the tropics. The fulness of his vessels gives the predisposition to be powerfully operated upon by heat; and then, violent exercise and intemperance readily become exciting causes. But in some instances, plethora itself becomes the exciting cause, and produces apoplexy or inflammation of the brain. More frequently, however, in these cases, plethora merely predisposes; and cold, or a full meal, particularly a hearty supper, proves the exciting cause. Extraordinary exertion, as stooping, coughing, &c., not unfrequently becomes the exciting cause. This exertion, particularly in coughing, interrupts the return of the blood from the head. The effects of vomiting have the same

operation. Hence the obvious impropriety of emetics in such habit of body. I have known apoplexy thus induced more than once.

Predisposition is *acquired*, as well as constitutional.

1. It is sometimes the result of *previous disease*, as in cynanche tonsillaris, croup, &c. I have already told you of pleurisy occurring no less than twenty-one times in one individual. The same remark will apply to fevers. Persons who have had intermitting fever, are peculiarly liable to its return from the slightest causes, without being exposed to the original cause which produced it. Galen tells of its having been renewed by the imprudent use of vegetable acids. I have known it repeatedly renewed by excessive venery in a young gentleman of this city. Hence, it was observed, during the plague of Marseilles, that newly married people very generally suffered from the pestilence. Those who suffer an intermittent in the fall, are very liable to an attack in the spring.

2. This acquired predisposition is often the effect of *intemperance* in eating or drinking.

3. The various *passions*, such as grief, anger, love, fear—all predispose to febrile attacks. Fear, especially, prepares the body to receive contagious diseases. It is noticed by Thucydides, that those who suffered much from fear or anxiety, were first affected in the plague of Athens, and were the most likely to be cut off by it. Diemerbroeck makes a similar remark: "Confidentes ut plurimum servantur; contra, meticulosi facile corripantur."—De peste, lib. i. c. viii. s. 9.

4. *Debility*, the effect of a *vegetable*, spare diet, predisposes to intermitting and remitting fevers. This I had an opportunity of observing at my botanic garden at Elgin, on this island. The labourers employed there, suffered greatly from this cause; but my own family, who ate animal food, as usual, escaped.

5. Debility, the effect of *water-drinking*, especially in those accustomed to the use of spirits or wine, is another predisposing cause. I heard the late Dr. Gregory say, that Dr. Kuhn, of Philadelphia, when in Holland, was severely attacked with intermitting fever. He used nothing but water as a drink: whereas his comrades, thirteen or fourteen in number, who drank wine—his own father, the elder Gregory, among the rest, all escaped. I found, too, that the water-drinkers among my workmen at El-

gin, suffered from the prevailing fever, while the grog-drinkers went free.

6. But the *excessive use of spirituous liquors* no less predisposes to febrile complaints, and often, by the prostration they induce, to the typhoid form of fever. Hence yellow fever is generally fatal to drunkards; or if they survive, as in the cases related before, it must be by the continuance of potent draughts of their accustomed stimulus.

7. A *vitiated state of the fluids* predisposes to fevers, and fevers of the most malignant character. This state is frequently induced by salt meats, the want of fresh vegetables, and the excessive use of animal food. They produce a putrid colluvies in the bowels, and thence in the blood-vessels. Scurvy, dysentery, and typhus fevers, are thus produced, as you will find by referring to Lind, Pringle, and Blane: and disease, once lighted up, soon destroys patients of this habit of body.

8. A *moist atmosphere* predisposes to fever. Catarrh, pneumonia, and phthisis, are hence the common diseases of our sea-board, and of Great Britain. The Irish employed to drain the drowned lands of Orange county, suffered exceedingly from this source of disease; and very many fell victims to typhus fever. Standing immersed in water, by the day and week, must necessarily have exposed them to disease; and that, too, of a malignant type.

9. *Climate* predisposes to fevers. A hot climate, especially after a residence in a cold one, renders the stranger peculiarly liable to fever upon the slightest debauch or irregularity. A hot climate, too, of itself, begets great excitement, and is followed by debility, and consequently an irritability, which is easily acted upon by causes that, under other circumstances, would prove harmless. In like manner, the inhabitant of the torrid zone, coming to our colder latitudes, suffers febrile diseases, and especially the phlegmasiæ, after the slightest exposure to exciting causes, which are innocent when applied to those habituated to our colder temperature. This fact should teach the youth who come from our southern states, to guard their persons by wearing flannel next the skin, and an additional garment, to meet the frequent changes of weather they have to encounter in this climate.

10. A *vitiated atmosphere* is another very frequent and fatal

source of febrile diseases, by the predisposition it creates ; while, in other instances, it is an exciting cause of fever. Thus, if vitiated air, from putrid bilge-water on board ships—the air of jails and of hospitals—the confined dwellings of the poor—sailors' lodging-houses—of small, confined streets—the air of market-places—of docks—of privies, loaded with fermentable materials, the product of decomposed animal and vegetable substances, predisposes to fevers. And these, when thus produced, rapidly propagate themselves, as far as such atmosphere extends. In some instances, this vitiated air is said to be an exciting cause of disease, as in the manufacturing towns of Great Britain, and on ship-board, producing typhus fever. This we have seen frequently exemplified in Irish vessels. On board the *Mohawk*, with a hundred passengers, the disease broke out in the cabin and steerage. Though both occurred in the heat of summer, the fever was typhus fever, not yellow fever, which requires a greater degree of heat, and of longer continuance. It indeed requires the heat of the torrid zone, and that, too, must operate upon the northern man to beget that peculiar form of fever. Hence new-comers, not the natives of the tropics, are the subjects of it, both in the West Indies and South America. In our climate, such impure or vitiated air, doubtless may give birth to febrile diseases of the intermittent, remittent, and typhoid type. But the more malignant, and the more fatal form of tropical fever, I have never seen thus produced—though it is the belief of the majority of the physicians of this city, and of Dr. Rush and his disciples, in Philadelphia, that it is thus engendered in our own climate ! But whether begotten here, or introduced, such atmosphere as we have mentioned, during the warmer seasons of the year, readily multiplies and extends the poison engendered or introduced. But does it so multiply ? and how does it multiply itself ?

We have already spoken of the assimilating fermentation, as it takes place in the human body, as in small-pox, and other diseases communicated by inoculation ;—we have also called your attention to the fact commonly observed, of the rapid diffusion of the putrefactive process among animal substances, when a taint of impurity, or foul materials may have been in-

roduced among them—as we have noticed in the process of packing beef or fish; and as illustrated by the experiments made by Sir John Pringle upon eggs. An analogous multiplying power appears in the atmosphere when once infected by the introduction of a contagious disease; as dysentery, yellow fever, and others. It is accordingly remarked, that the disease so introduced remains limited, for a certain space of time, to the spot where it first made its appearance. Accordingly, I have observed, (for I have been an eye-witness of the facts I give you on this subject,) that in 1791, 1795, 1796, 1797, 1798, 1805, 1819, and 1822,—the yellow fever appeared, not in the same part of the town, but at different parts, in every season of such visitation. It began in 1791, at Burling-slip. It did not appear at those constant deposits of filth, the Collect, (now “the Five Points”)—the Fly-market—the Bear-market—Catherine-market, and other places proverbially filthy: but at entirely different spots of the city. In 1795, at Peck-slip;—another year, at the Coffeehouse-slip;—a fourth year, at the ship-yards; and twice at the Old-slip. At each of those places, the disease remained stationary for many days, (assuming the character of what would be denominated sporadic,) influenced, in some respects, by the state of the weather, and the degrees of heat, moisture, and the state of the wind; but usually observing a definite period—insomuch that its subsequent diffusion was at length uniformly anticipated by our citizens, as it had been in 1795, by that sagacious observer, the elder Dr. Bard.

This is not all—it will perhaps appear to be totally suspended and gone, when, at the end of a certain period of time, (this, too, pretty uniformly, as it regards the period,) it again is suddenly lighted up, and spreads extensively along in the vicinity, as an endemic; but it is conveyed to other parts of the town, and forms new centres, from which it becomes extensively diffused. The epidemic, comparatively speaking, during the first few days perhaps, is confined to a single case, as in the case of Mr. Jenkins, in 1795; or in another year, 1791, when Gen. Malcolm was attacked. These cases die off. We hear no more of it. Some days (say from ten to fourteen) intervene—it re-appears in the same neighbourhood—many now

sicken, and a general fatality follows, creating alarm and consternation throughout the city.*

In the history of the Plague of Marseilles, the same deceitful pause is frequently recorded by the historians; after which new centres were formed, which scattered the pestilential rays to such an extent as to involve a whole city in distress and death. I must caution you against Dr. Miller's incorrect statement and false reasoning, the result of an error in his premises. I refer to his report as resident physician, in which he overlooks the first point where the poisonous material showed itself;—but most carefully enumerates all the second, subsequent parts of the city to which it was introduced from the first. On the contrary, the Board of Health, of which he was a member, in several years—in 1795, 1798, and others, (see Hardie's Reports, taken from the Minutes of the Board of Health,) stated distinctly and emphatically to the citizens, that the disease was so exclusively *located*; and advised an abandonment of such parts of the town. Many of the cartmen, carpenters, and masons, who worked at the new buildings at the Coffee-house slip, and returned to their respective homes, principally on the north side of the city, and Rutgers' grounds, sickened. The Board traced all their first cases to that source, and advised the abandonment of that part of the city. This was communicated to me by Dr. Douglass, a member of the Board at the time. But no—the citizens remained, tied as by a spell to the fatal spot.—It spread.—Its new lines of demarcation were again pointed out by the corporation, with threats to compel an abandonment, but without effect. Our citizens resorted to it still, conveyed the poison to other parts of the city, and thus involved a considerable portion of the city in one scene of mortality and distress. This assimilating process became almost manifest to the senses, in this gradual extension of the disease.†

See my letter to Dr. Chisholm, and his criticisms on Dr. Miller's Report. See also Hardie's various reports, prepared under the direction of the corporation; and in these you will

* Rev. Dr. Smith, of Princeton College, N. Jersey, most wisely wrote me a letter, in 1805, cautioning me against the evils of neglecting those measures which are necessary to guard against the subsequent multiplication of the disease.

† See my Discourse—Appendix to Thomas's Practice of Physic.

find an ample refutation of the errors, both in the premises assumed by Dr. Miller, and in the conclusions he has deduced from them.

11. *Contagion* itself, like marsh miasma, in some instances becomes a predisposing, as well as the exciting cause of fever. The person under its influence is even conscious of a slight degree of febrile irritation in his system, but which is frequently counteracted by temperance and attention to his evacuations; but is, however, readily called into action by an exciting cause, as fatigue, cold, heat, irregularity in diet, intemperance, loss of sleep, &c.

During our epidemics, I experienced frequently the sensation of burning hands, a dry skin, and vertigo; my whole sensations were disturbed. But by care in my mode of living, the liberal use of fruits and vegetables, with the occasional use of laxative medicines, I was enabled to resist the disease a long time. The same observations were made by Dr. Rush. (See his account of his own feelings and situation.)

Nor, as I have said before, are marsh effluvia always an exciting cause of intermittent fevers. Like contagion, they also are sometimes the predisposing cause. For the most part, however, the reverse is the case—that the fatigues of the camp, a hot climate, excessive exercise, and intemperance, by debilitating, and thereby deranging the functions of the system, predispose the body to the action both of contagion and of marsh effluvia as the exciting cause.

LECTURE XI.

EXCITING CAUSES OF FEVER—EXERCISE, HEAT, COLD.

WE now proceed to take a view of the second class of the remote causes, viz., those which more immediately excite fever, or febrile diseases;—they are hence called *exciting causes*. The first of these, is *violent exercise*. By the excitement it produces upon the nervous system, its effects are also extended to the moving fibres of the heart and arteries, and the other parts of the system. Stage riding, violent and long-continued exercise on horseback, are hence frequently the exciting causes of fever; more especially when conjoined with the usual accompaniments, spirituous liquors, and other stimulant drinks, which the traveller generally has recourse to, in some shape or other, instead of plain water or lemonade, which should be his only beverage during the excitement created by this inordinate exercise. On the contrary, the gin sling, the pot of gingered cider, the mint cordial, the glass of bitters, or some other form of alcohol, are the usual juleps of the traveller, in most countries, and rarely fail to excite a febrile state of body. Some years since, travelling to Albany, in company with a gentleman of high distinction, I drank water—he took his mug of cider, well powdered with ginger, at most of the houses at which we stopped. When we arrived at the end of our journey, he was so much excited that he required two or three days to calm the commotion produced, while I felt comparatively little or no effect from the journey, although it was in the winter season, and the roads were unusually rough. I am frequently called upon to prescribe for fever, thus induced by violent exercise, and this species of intemperance, combined.

Inordinate exercise of the mind, especially when not relieved by regular sleep, is also an exciting cause of fever. I am now attending a gentleman, who has been ardently engaged in preparing a work for the press, and who, in consequence of want of his accustomed sleep, in connexion with intense application, has been attacked with continued fever, and in whom the head is particularly affected.

2. *Heat* is another and a frequent cause of fever. By heat, I mean caloric, the matter, not merely the sensation, of heat—for heat, like cold, is absolute or relative. The absolute heat of a body denotes the quantity of caloric such body contains, as measured by the thermometer or pyrometer, while the relative heat only signifies its comparative temperature; i. e. compared with itself, or with other bodies, and refers itself more especially to our feelings as our measure. We shall illustrate this directly, when speaking of cold; and confine ourselves at present to the effects of caloric upon the body; more especially as communicated by the direct rays of the sun, or generated in the system by other causes. In either case, it occasionally becomes the exciting cause of febrile action. We perceive the effects produced upon our system by the direct rays of the sun, in the expansion which it gives to our fluids in the spring of the year, especially when its influence is suddenly communicated, as after a severe and cold winter. We then become sensible of its effects in all our feelings, producing headache, vertigo, numbness, and tingling in the extremities; and if not counteracted, these are frequently followed by inflammatory fever (synocha,) or by hæmorrhages, in the form of hæmoptysis, epistaxis, or apoplexy, (the hæmorrhagia cerebri, as Hoffman calls it,) or perhaps palsy is produced by the same cause. In some instances, serous effusions in the cavities of the body are the result. Or we see its effects in the production of gout, or of some of the phlegmasiæ, which are all readily induced in that season of the year. But the direct effects of heat are not only perceived in our feelings, or in its operation upon the excitement of the system. It shows its effects upon our secretions. The skin, the kidneys, and even the seminal vessels, show its operation in this respect. For in the spring of the year, the expansion of the fluids is no less manifest in the animal body, than it displays itself in the rising of the sap in the

vegetable structure. In like manner, upon a change of climate, from a cold to a hot one, we are liable to a *coup de soleil*, a stroke of the sun as it is called; that is, to phrenitis, and to apoplexy. A great number of such cases occurred here in the summer of 1811. In cold weather, also, apoplexy is a disease of frequent occurrence. The same effect is produced by apparently opposite causes. But, in truth, it is resolvable into the same as it regards pressure on the brain.

The *causus* or ardent fever in hot latitudes in general,—the yellow fever in the West Indies and South America, the strangers' fever in the southern states, and indeed in New York, (foreigners especially, who are unaccustomed to our heat and our climate, suffer from this latter form of fever,) are all attributable, in a great degree, to the effects of heat. The effect of heat in aggravating the remitting fever of the southern states, which exhibits a much more inflammatory type than the same disease in the more temperate latitudes, you will see admirably described by Dr. Norcom, in his account of the fevers of North Carolina. This form of fever, in consequence of the inflammatory action which is superinduced as the effect of heat and habit of body, is very generally confounded with the yellow fever of the West Indies! It doubtless, excepting the plague, is the nearest approach to yellow fever that exists:—but although they are thus nearly allied, they are asymptotes, which can never meet. There are some lines of discrimination between them, that are as fixed as those which separate the small-pox from the measles, or the plague of the Levant from the ordinary bilious remittent of the United States.

The heat of climate or season, especially when blended with exercise, readily produces fever, as in the case of Dr. Rowe, a pupil of mine, who went to settle himself at St. Croix. But cases of fever produced by the heat of climate, and especially when in co-operation with severe exercise, hard labour, and perhaps intemperance, are met with in every book of practice: I need only refer you to those of Blane, Pringle, and the Linds. Our own annual observation also furnishes constant testimony of the effects of heat, as an exciting cause of fever and of febrile diseases.

3. *Cold* is among the most frequent of the exciting causes

of fever. It is with cold as with heat; the term has two meanings. It denotes the sensation of cold—it also signifies the real diminution of temperature, or the abstraction of caloric. These are two totally different things, and are not always connected. We feel hot, or we feel cold, when we are not really so, as we have already observed when describing the symptoms attending the first stage of fever. Our feelings not only depend upon the condition of the nervous system, but in this particular they also depend upon our previous sensations, and upon our previous real degree of heat or cold, according as our temperature may be above or below the healthy standard. For example, immerse the hand in water at 100° — $97\frac{1}{2}^{\circ}$, which is the natural temperature, will in this case be cold to our sensations. Again: immerse the hand in a mixture as low as 50° . In that case, 60° or 70° , though below the natural temperature, will still be hot to our feelings as the test. Our sensations, therefore, depend upon our preceding feelings and our preceding temperature. Heat and cold are consequently very properly called relative heat and relative cold. This distinction is of great importance, as applied to the various states of the human body. For instance, it is of great importance in the treatment of asphyxia from cold; because, with this distinction before us, we adjust or proportion the temperature of our applications to that of the body to be acted upon. We are hence taught to apply our heat gradually, beginning a few degrees only above the temperature of the frozen body. In such case we begin with snow, which is comparatively warm. We next apply cold water, that is, water at its ordinary temperature, which is still warm enough to be a stimulus to the still colder body. We thence proceed to the use of water moderately warm, &c. Upon the same principle the application of spirits of wine, spirits of turpentine, and other spirituous and highly stimulating applications to burns are recommended, inasmuch as they constitute the next grade of stimulus to the part. Hence, the absurdity of cold applications, especially when conjoined with the sedative effects of lead, in the form of saturnine solutions, frequently prescribed by physicians who do not advert to this principle. Without observing these grades of temperature in our several applications, we may waste the small portion of excitement

which remains in the body whose animation is suspended. As in the management of the spark of culinary fire, we extinguish it by a strong blast, so by an excessive stimulus, disproportionate to the excitement, we totally extinguish the small and feeble remains of the vital principle. This is no less applicable to the part than to the whole system. Absolute cold, as applied to the living body, is the real diminution of its temperature below the healthy standard of $97\frac{1}{2}^{\circ}$. And except when the surrounding bodies are below 62° , it is remarkable that we retain that temperature, that is, the body being in a healthy state. But in debilitated habits, where, from want of nourishment, or debility otherwise induced, the heat-generating power of the system is certainly diminished in proportion to the weakened powers of the vital principle—in that case, the heat is diminished and not supplied accordingly, and the patient suffers; as was the case with the people working at the Walkill, in draining the drowned lands. Although the temperature was not as low as 62° , they could not counteract the abstraction of their caloric at that higher temperature. Fevers, then, are produced from moisture alone, and which, judging from the season of the year, could not have been as low as 62° .

It is well ascertained, that air at 62° will not reduce our temperature, though denser bodies will, in proportion to their density. For in that proportion, as well as according to their own temperature, they abstract our heat: as mercury and water, which possess a conducting power in proportion to their density, and abstract it more readily than the atmosphere. Although, therefore, our bodies could resist an air at 62° , we could not resist the loss of our heat at that degree, immersed in water or mercury. On the contrary, we should soon be frozen.

In like manner, in air *below* 62° our heat would be abstracted. Fordyce, Hunter, Crawford, and Sir Charles Blagden, by their celebrated experiments, (see Phil. Trans. vol. lxxv.)* have also shown the wonderful power which the human body possesses of resisting heat, by preserving its temperature within a very few degrees of the natural temperature, although the

* See also Hunter on the Animal Economy, and Crawford on Animal Heat. See also Garnett's Lectures on Zoonomia.

surrounding air was heated to a degree far exceeding $97\frac{1}{2}^{\circ}$, viz. at the high degree of 230° —a heat sufficient to roast eggs and to broil beefsteaks. Yet that heat was counteracted by the constant evaporation going on from the surface of their bodies; the fluid issuing from their bodies combining with the caloric of the body from which it proceeded, leaving it relatively cool. How important then is the inference in favour of perspiration counteracting a febrile state of the body by the abstraction of heat. Hence, as before observed, fanning their bodies scorched them, by bringing a new stratum of heated air in contact with their surfaces, that had been thus relatively cooled. In like manner, the body has the power of resisting cold for a certain length of time, as well as heat.

Delile has observed a degree of cold in Siberia, 70° below the zero of Fahrenheit, notwithstanding which, animals lived. Professor Gmelin has seen the inhabitants of Janiseisk, under the fifty-eighth degree of northern latitude, sustaining a degree of cold which, in January, became so severe that the spirit in the thermometer was 126° below the freezing point. Professor Pellas, in Siberia, those who visited Hudson's Bay, and the late navigators in search of a north-west passage, have experienced a degree of cold very nearly equal to this. Hence, then, we see the wonderful power of the system in generating a greater degree of heat, when surrounded by so cold a medium. But in a cold climate and atmosphere, does the body generate more heat? Yes it does, and this must necessarily be the case, or death must ensue. Another question then arises, in what manner is this effected? To answer this question, it is necessary to remember, that the heat of the body is chiefly generated by the decomposition of oxygen gas in the lungs during the process of respiration. The atmosphere, we must recollect, consists of two species of air—the one oxygen gas, or vital air, the other nitrogen gas—the one capable of combustion and of supporting life—the other not; and that these two gases exist in the proportion of nearly one of the former, to three of the latter. We also know, that air which has undergone the process of respiration, is found to contain a mixture of nitrogen and carbonic acid gas, with a small quantity of oxygen gas, and a considerable quantity of water thrown off in the form of vapour. But from a variety of facts, it is ascertained that

oxygen gas is decomposed in the lungs during respiration; that a small and inconsiderable part of it unites with the iron in the blood, converting it into an oxide—that, 2dly, another and greater portion of it unites with the carbon brought by the venous blood from all parts of the body to the lungs, and thus forms carbonic acid gas. And that, 3dly, in addition to the watery fluid exhaled, another portion unites with the hydrogen brought in the same manner by the blood, and forms the halitus or vapour. Thus, then, we account for the appearance of those several products of respiration. Hence, we see that the explanation of the manner in which animal heat is evolved, follows as a simple and beautiful corollary from the theory of combustion. That respiration is an operation in which oxygen gas is continually passing from the gaseous to the concrete state, and that the heat which it held in its gaseous form is given out at every inspiration; and that this heat being conveyed by the circulation of the blood to all parts of the body, is a constant source of heat to the system. These facts lead to the solution of another interesting phenomenon. They enable us to explain the reason why the animal body preserves the same temperature in all the various changes which occur in the temperature of the atmosphere, whether in summer or winter, on the frozen plains of Siberia, or the burning sands of Africa; for it is a fact, that man breathes the atmosphere of this earth, whatever may be its elevation, its temperature, its dryness or moisture, with nearly the same results. The æronaut who soars miles above the earth, or the miner below its surface, the peasant of the Alps, or the half frozen Laplander, the sirocco-breathing African, the inhabitant of the sandy deserts, or the Hollander in the midst of his dykes and canals, are by habit rendered equally exempt from the pernicious effects of those opposite states of the atmosphere. In winter, we know the air is condensed by the cold, and consequently contains more oxygen in proportion to its quantity or its bulk. The lungs, therefore, receive at each inspiration a greater quantity of oxygen in the same bulk of air. The heat extricated will be consequently proportionally increased. In summer, on the contrary, the air being rarified by the heat, the same quantity of air will contain less oxygen in proportion

to its bulk; consequently, a less quantity of oxygen gas will be received by the lungs in each inspiration; and the heat which is extricated, will necessarily be less. For the same reason, in northern latitudes the heat extricated by respiration will be much greater in proportion to the bulk of air respired than in the southern. By this simple and beautiful contrivance, nature has modified the extremes of climate, and enabled the body to bear vicissitudes which would otherwise destroy it. Thus then, the body, as said before, possesses the power of resisting cold for a certain length of time; but continued in contact with a body at 62° , especially a dense body, as water, the system loses its caloric faster than it can be restored,—a torpor of the system ensues,—gangrene follows, and at length life is exhausted. But though the human body has been so wisely constructed as to bear, without inconvenience, a considerable and even sudden variation of temperature; yet, I repeat it, there is a limit, below which the diminution of heat takes place faster than it can be regenerated; and if this situation be continued, the heat of the animal must be diminished—the functions lose their energy*—the sensibility of the body is destroyed—an insuperable inclination to sleep succeeds, which, if the unfortunate sufferer indulge, his sleep is death. This is confirmed by the very interesting account given in Cook's Voyages, of the sufferings of Dr. Solander, Sir Joseph Banks, and other

* I may mention here, although not immediately connected with our subject, the agency of cold in producing scurvy. Captain Morrik, a Dane, wintered in the year 1619 in Hudson's Bay, lat. $63^{\circ} 20'$. He was well supplied with provisions, and had with him sixty-four persons. All perished of scurvy, except himself and two of his men. In 1633, two experiments were made by the Dutch; one at Spitzbergen, the other on the coast of Greenland, in lat. 77° or 78° . Seven sailors were left at each place; and all died of scurvy at both. Captain James, an Englishman, with a crew of twenty-two persons, wintered on an island in Hudson's Bay. They were compelled to labour out of doors during the severest weather; but only two died. Another singular fact is related. In one case, eight Englishmen, and in another, four Russians, were left by accident in the Arctic region, without provisions. In the ensuing spring, the Englishmen all returned home. The Russians all survived six years—then one of them died. The others were shortly after rescued. It is to be remarked, that those who died, in all the instances mentioned, fed on salted provisions, led an indolent life, and used spirituous liquors: those who survived, used fresh animal food, drank water, and used much exercise.

fellow-voyagers, some of whom perished on the heights of Terra del Fuego.

Dr. Solander, who had more than once crossed the mountains which divide Sweden from Norway, well knew that extreme cold produces this irresistible torpor, and propensity to sleep; he therefore conjured the company to keep themselves always in motion, whatever exertion it might require. "Whoever sits down," said he, "will sleep; and whoever sleeps, will wake no more." Thus admonished and alarmed, they proceeded; but while they were upon the naked rocks, the cold was so intense as to produce the effects which had been apprehended. Dr. Solander, himself, was the first who felt the inclination against which he had warned his companions, and insisted upon being allowed to lie down. Mr. Banks, (the late Sir Joseph Banks,) entreated and remonstrated in vain. Solander laid down upon the ground, though it was covered with snow—it was with the greatest difficulty he was prevented from sleeping. One of his black servants also began to linger, having suffered from the cold in the same manner as the Doctor. Partly by persuasion, partly by force, they were carried forwards; but they soon declared they would go no further. Sir Joseph again entreated and exhorted, but without effect. When the poor black was told that if he did not go on he would shortly be frozen to death, he answered, that he desired nothing so much as to lie down and die. Dr. Solander said that he would go on if they would first allow him to take some sleep, though he had before told them, that to sleep was to perish. They both, in a few moments, fell into a profound sleep; and after five minutes, Sir Joseph happily succeeded in awaking Dr. Solander, who had almost lost the use of his limbs. The muscles were so much shrunk that his shoes fell from his feet; but every attempt to recall the unfortunate black to life proved unsuccessful. See Garnet's *Zoonom.* p. 32.

So far, then, cold, when continually applied to the body, exerts a directly sedative effect upon the system, by its lower temperature, and its long continuance; but cold, when it is suddenly applied, and for a short space of time, manifests a contrary operation—that of a stimulant to the part, or to the whole system—depending, for its effects, upon the previous temperature, and previous feelings of the body; for the condi-

tion of the nervous system, the power of the vital principle, controls and influences the effect of this, as well as other applications made to our bodies; for we are not to reason of animate as of inanimate bodies. Cold, then, is stimulant or sedative, depending on our previous temperature, and our previous sensations, as well as the time, manner, and other circumstances of its application. We are powerfully excited by a change of season:—after the relaxing effects of a hot summer, we are all animated by the cold of autumn or of winter;—this is not only observable in man, but the horse, and almost every other animal are in some manner excited by the first impressions of the cold of winter.

Diseases, too, acknowledged by all to be diseases of excitement, as the phlegmasiæ, are produced in great abundance by this cause. The dews and cold of the night, after a hot day, in like manner produce diseases. The system being previously excited, and the perspiration, which had been flowing freely, becoming suddenly arrested, dysentery is produced; which is another disease of acknowledged excitement. It is well named by Dr. Sydenham *febris introversa*—a fever turned in upon the bowels. Cold, in the manner mentioned, is one of its most usual exciting causes.

Yellow fever, another disease of excitement, is also frequently thus produced in the torrid zone, by exposure to the relatively cold air of the night, especially where predisposition exists; and perhaps the materies morbi may already have been received into the system. Malignant fevers, where a predisposition exists, are frequently thus excited by the cold air and dews of the night, on ship-board and in camps. Even in jails, and the manufacturing towns, the night air is oftentimes one of the exciting causes of typhus fever. When the contagion may exist in the body, it is readily thus excited into operation by such change of temperature. Coming out of a heated atmosphere, after excessive exercise, as dancing or fencing, the body being previously heated by riding or running, and then suddenly cooled in a stream of cool air, by draughts of cold water, by throwing off our clothing, and by exposure of the body to a cooler atmosphere, or a cold bath—fever, in such case, is readily excited.

While I had the direction of the botanical garden, I suffered

several very severe attacks of sore throat, that were thus induced by exposure to the cold air, after remaining some time in the heated air of the hot-house; for the circulation being excited by the causes mentioned, the excretion by the skin flowing and increased, a sudden change of temperature instantly produces a check of that discharge, by creating a preternatural constriction of the small excreting vessels of the surface, and of the smaller circulating arteries. The consequence is, a sudden resistance to the propelling power of the heart and larger vessels. A sudden plethora of them is necessarily the result, which vents itself in a general fever, and perhaps the affection of some irritable part of the body. These I call the stimulant, not the sedative, effects of cold. These stimulant effects, too, are increased by the new impulse which is given to the circulation by the crowded state of the heart, and of the larger vessels—analogous to the mechanical effects of the tourniquet, when applied before or during the cold stage of fever, to prevent or shorten the paroxysm of an intermittent, as recommended and practised by Dr. Kellie. See Duncan's Commentaries, vol. xix.

LECTURE XII.

CAUSES OF FEVER.—COLD.

WE also observe the stimulant effects of cold, when applied for the purpose of arresting hemorrhages, as in menorrhagia, or in the hemorrhage after parturition, when the womb does not go on to contraction. A glass of cold water given to the patient will bring on its action, and expel the placenta. And lately the practice of injecting the placenta through the vessels of the cord, with cold water, has been recommended for the same purpose, and used with success. Here let me say, that it is not necessary for this purpose, as recommended by Burns, to stuff or plug the vagina, as he expresses it; for you are to recollect you are not plugging an inanimate tube; you are acting upon a very sensible part of the body. The application of cold to the pubes, or to the abdomen, is very generally sufficient, with other remedies addressed to the whole system. In epistaxis, cold is not applied to the bleeding vessel itself. Even prejudice at this day, the result of past experience, makes the application to a distant but sensible part of the body. In some countries, the great church key is sent for, and applied to the back of the neck, and is believed to possess some peculiar virtues; though any other cold body would be equally efficacious. A cloth dipped in cold water, or a snowball, applied to the scrotum, is also sometimes had recourse to, with success. These facts are familiarly known: the principle, too, upon which these remedies operate, is apparent. We see the stimulant effects of cold air, in arresting hemorrhage, after capital operations.* It is a good rule in operations to expose

* See my letter to Dr. Bard on this subject.

the wound to the air, until the circulation is restored. This, in my opinion, is not sufficiently appreciated. Cooper himself seems to think lightly of it. But surgeons would have less frequently to open newly dressed wounds, did they more generally adopt it. I once extirpated the whole breast in a young lady, without using a single ligature. The hemorrhage was arrested by the exposure of the wounded surface to the air for some fifteen or twenty minutes.

The stimulant and tonic effects of cold, are also observable in its counteracting the relaxation which frequently occurs in the system, both local and general. We see it in the removal of relaxations of the scrotum, of the cremaster muscles, and of the spermatic veins. Debility in all of these organs is a disease of frequent occurrence, especially in warm climates, and in the warm seasons of temperate climates; it is, too, an important disease, for by its continuance, it is well known that the power of the genitals is very much impaired. Indeed the vigour of those organs, we know, very much depends upon the tone and condition of these appendages. Although this disease has no place in our nosologies, it is very well known in the West Indies, and in southern climates. I allude to the disease vulgarly called *the whiffles*. In cold climates, and in cold seasons of our climate, this relaxation is not known, but which ought to be the case upon the principle that cold is a sedative, and debilitating to the body. This disease is cured by the application of cold water to the parts concerned, night and morning, or by a general cold bath, and other tonics, where the whole system is at the same time greatly debilitated. If the relaxation be very considerable, a suspensory bandage may also be employed with benefit, as an auxiliary in sustaining the debilitated organs.

The veins of the testes, like the hemorrhoidal, become relaxed, especially by age, when the venous system in general becomes enlarged from the diminished resistance in the coats of the veins. A similar varicose enlargement of the veins takes place in the lower extremities, both in males and females—more frequently, however, in the latter, the consequence of some previous pressure upon them, or impediment to the passage of blood in them, occasioned by pregnancy. I have seen a case of varicose enlargement of the veins of the lower extre-

mities, occasioned by a truss applied for a supposed hernia, which proved to be a varicocele. I also saw a case, in which the same disease was produced without any apparent cause. In both of these cases, a flannel roller and cold applications, either of spirits or water, and in summer the cold bath, are the remedies proper to be employed. The remedy now used in France, is to remove a portion of the vein thus affected, and afterwards pressure to facilitate the union of the parts from whence the excision may have been taken.

In fluor albus, a disease frequently occasioned by debility, cold washing, and even cold injections into the vagina, are among the most valuable remedies that can be prescribed. Accordingly, the women of France, compared with American females, are seldom affected with fluor albus, owing to their daily use of the bidet. Here, however, let me caution you, on account of the stimulant operation of cold, against the use, or rather the abuse of it, during menstruation; in obstruction of the menses; and in that species of fluor albus which proceeds from the fulness of the uterus, and of the whole system, the effect of the natural cessation of the menses—in other words, the effect of plethora, general and local, which is aggravated by cold, and is only to be relieved by venesection and other evacuates of the blood-vessels. In like manner, where the uterus, in consequence of such obstruction, is affected with pain, and other symptoms of inflammation, cold applications invariably aggravate the symptoms.

The stimulant effects of cold suddenly applied to the system, are also apparent in the recovery of persons from deliquium, and in the asphyxia of new-born infants. And in asphyxia from the fumes of charcoal, it is one of the most efficacious remedies that can be employed.

When dogs, at the Grotto del Cani, have been suffocated by its vapour, it is a common practice to plunge them in the adjoining lake (Lake Avernus) to recover them. In like manner, in the torpor attendant upon convulsions, when weaker stimuli fail, the sudden affusion of cold water on the naked body will excite and increase sensation that has been dormant. In the convulsions attendant upon pregnancy or parturition, and which are frequently repeated in paroxysms, sprinkling the face and other sensible parts with cold water, frequently interrupts the

return of the convulsions, by the new impression that cold water thus applied produces upon the whole system.

“The stimulant action of cold,” says Dr. Currie, “though short in duration, is powerful in degree.” Nor is its effect short in duration, as Dr. Currie supposes; for the cold bath is certainly one of the most powerful tonics of the *materia medica*, and one of the most permanent stimulants in its effects upon the system.

We also see the tonic and stimulant operation of cold in the effects of a general cold bath, and the application of cold air. Such is the contractile operation of cold on the smaller vessels, that the very first effect is, in some cases, to produce a momentary paleness; the excitement, however, instantly succeeds, the whole surface glows with blood and heat, the circulation is manifestly excited, and preternaturally so. Respiration is proportionally quickened, and succeeded by a general diffusion of heat throughout the body. If, however, it be applied to the enfeebled body, and continued any length of time, it exhausts the excitement by abstracting the caloric, and with it the remains of heat and life. But to the body in health and previously heated, it is powerfully stimulant. By washing the body when thus heated, and the sweat is flowing from the surface, erysipelas, rheumatism, pains in the back and limbs, are frequently produced. Even washing the neck with cold water in *cynanche tonsillaris*, aggravates the disease, by increasing the excitement, as I have several times experienced in myself. Gargling the throat, I must tell you, though a very common practice, has the same effect of increasing the irritation in that disease. I have also witnessed the same injurious effects from the application of cold, in increasing the inflammation attendant on dysentery.

The same remark is no less applicable in enteritis, from whatever cause it may be produced. Though I perceive the application of cold water to the belly is sanctioned by Dr. Thomas, I must here most earnestly enter my protest against this practice in that disease, or indeed in any disease attended with active inflammation. I go still farther: the application of cold to an inflamed eye, to an inflamed testicle, to the recent injury of the joints from strains, I consider equally objectionable. On the contrary, the relaxing, soothing, and emol-

lient effects of tepid applications, are indicated in the first stage of those diseases of excitement. I tell you this as the result of nearly forty years' experience in practice. But the beneficial operation of cold bathing, general and local, in the last stage of those diseases, is well established, except when the debility is excessive, and the heat-generating power of the system has been greatly impaired. Habit, however, may counteract the effects of cold upon the system. Accordingly, in Russia, it is not unusual to go from apartments highly heated, or from a bath heated from 106° to 116° of Fahrenheit, and plunge into snow or cold water, at the freezing point, without producing fever.

The Roman youth, when heated by their exercises in the Campus Martius, in like manner plunged into the Tiber with impunity.

The previous excitement, especially in athletic habits, is such as instantly by its reaction to counteract any check given to the action of the smaller vessels of the surface. Habit certainly may diminish our susceptibility to the effects of cold, as of other agents upon the constitution. We do not all take the small-pox when exposed to it. We do not all take contagious fevers, as yellow fever or dysentery, though we may be exposed to them. Physicians and nurses, habituated to the action of the poison producing diseases, frequently escape on this account. Nor do we all take cold even from wet feet; but where persons are much in the practice of bathing the feet in warm water, this is not an unusual effect of the great sensibility that is thus endured.

I was formerly subject to frequent attacks of sore throat, and at that time was in the habit of bathing my feet in warm water two or three times a week. But since I have adopted the practice of washing exclusively with cold water, I have rarely been affected with the disease. Many persons subject to cold feet and legs, are thus cured by the application of cold water. Frosted heels are in like manner prevented, by the practice of cold washing, as well as by the local use of spirits of turpentine, alcohol, or other stimulants.

Sudden vicissitudes produce fever, as going from a warmer to a colder atmosphere. In the interior of Africa, it is not uncommon for the temperature of the atmosphere to be, for

weeks together, as high as 130° of Fahrenheit. In such case, the sudden change down to 100° , as Dr. Fordyce believes, would doubtless, as a stimulant, constrict the extreme vessels, both exhalent and circulating, and fever be the consequence. But he states, that he has known going from 100° to 80° , and even the transition from 60° to 40° , to produce fever, (p. 134,) and which, by the by, is another example of the effects of cold in producing diseases of excitement. In other words, that cold under peculiar circumstances, and those chiefly depending on the state of the nervous system, operates as a powerful stimulant or excitant to the system.*

They show the direct stimulant effects of cold water and ice applied to the limbs. Another important result arrived at from those experiments is, that the arteries derive their power of action from the nerves with which they are supplied, and not from a separate *vis insita*, or inherent irritability.

* Experiments of Dr. Home—see Eng. Journal, No. 4. vol. iv.

LECTURE XIII.

CAUSES OF FEVER.

WE have noticed the stimulant, as well as the sedative operation of cold, and endeavoured to show that these different and even opposite effects are produced by it, depending on the manner in which cold is applied to the body, the medium through which it is applied, whether by air or by denser bodies, as water or mercury, the temperature of that medium, the duration of its application, the suddenness with which it is applied, the state of the nervous system, and the vigour of the circulation, or of the power generating and diffusing the heat of the body.

In the conclusion of the last discourse, I also stated, that sudden changes from a higher to a lower temperature, as observed by Dr. Fordyce, expose the body to diseases of excitement; that they not only render the body liable to fever, but to many other diseases of a febrile character.

Dr. Fordyce admits the fact that fevers—that is, fevers strictly so called, are of more frequent occurrence in warm than in cold climates; but he ascribes it to the sudden diminution of temperature as the cause, at the time when the body is exposed to a high temperature; that is, that in a very hot climate, exposure to cold or night air produces fever; whereas in a temperate climate, such exposure to cold would not produce fevers, but perhaps one of the phlegmasiæ; and, therefore, that the cause of these different effects, is to be looked for in the high thermometrical range which occurs in hot latitudes. But great heat or excitement of itself, acting upon the stranger, doubtless, as before remarked, will directly produce fever, without such vicissitude. Yet from cold, as dews and the night air, this effect is certainly more likely to happen.

But this more frequent occurrence of fevers in hot climates, is probably in part owing, not merely to the vicissitudes in a high thermometrical range, as Fordyce expresses it, but to the long-continued previous effects of heat upon the constitution, changing the condition of the body, of the fluids as well as the solids, at the same time that the sensibility to impression in the nervous system is increased by the debilitating effects of heat.

In cold climates, again, we see catarrh, pneumonia, and the phlegmasiæ, in general produced; and in cold climates there is certainly no such predisposition to fevers, properly so called, compared with the predisposition we find in hot climates;—no such septic tendency of the fluids of the body, nor such debility and consequent irritability of the nervous fibre, both of which have effect in a hot climate, as predisposing causes of fever.

This, I believe, is the true reason of that difference of predisposition, and not that assigned by Dr. Fordyce, who (p. 135, vol. i.) considers merely the higher temperature of the climate in which those transitions take place, as having the effect, without explaining the manner in which that temperature operates. “As to the manner,” he says, “it is not attempted to be explained.” But, in my opinion, the manner of its operation is very apparent, and in the way already stated, viz., by producing a debilitated habit of body. And it is to be observed, that intemperance and excesses of different sorts, very generally concur with the heat of the climate, in producing such debility—an irritable, susceptible state of the whole system, is the inevitable consequence, followed by a deranged state of the digestive organs, and of the whole alimentary canal, and consequently an altered or deranged condition of the whole mass of the circulating fluids—for an imperfect or bad chyle cannot produce perfect or healthy blood. And to these is added, a disturbed state of most of the secreting and excreting organs of the whole system. All fevers and febrile diseases must hence, necessarily, have a greater tendency to the typhoid character, in a hot and relaxing, than in a cold and invigorating climate, unless we totally exclude the fluids from all concern in the human body, and from all participation in its diseases—and, indeed, the solids too; for if the secretory organs of the body are deranged, such derangement of the fluids, the product of the secretions, must necessarily be de-

ranged also. And vice versa, if the fluids are affected, the solids secreting and influencing the character and properties of such fluids, must also themselves have been in some degree deranged or impaired, to produce such condition of the humours they convey or secrete.

We also witness a similar predisposition to fevers, in the hot seasons of our own climate, and indeed in the hot seasons of most temperate latitudes. Besides, where cold, in a hot climate, or in the hot season of temperate climates, is the exciting cause of fever, the heat of such climate and of such season, operating upon the constitution, before the application of cold, the nerves and blood-vessels, I say, all being previously excited, and the secretion flowing, the result of that impetus given to the vascular system, cold in that case, has assuredly more effect than it could otherwise produce, without such predisposition. Cold, then, arrests all these excretions and exhalations, diminishes very suddenly the flow to the surface, and in this way excites the whole system into febrile action. This leads me to notice what I consider to be another error of that great practical physician, Dr. Fordyce, see p. 136, vol. i. He observes, that cold suddenly applied, and cold slowly or gradually applied, have the same effect! He grants that, in both cases, cold acts by restraining the evaporation from the surface, and by contracting the exterior vessels. Yet, in the one case, he asserts that when cold is suddenly applied, fever is produced; in the other, not fever, but some other disease. He further observes, that the gradual diminution of temperature has never been observed to produce fever, and therefore concludes, that such fever cannot be the operation of cold. I grant this fact, that the gradual changes from heat to cold will not produce fever; and I will grant another fact connected with it, that by going from a cold climate to a warm one, in the winter season—or, in other words, gradually changing our temperature, we do not readily take the fevers of a hot climate; i. e. not as arising from the climate itself. But I deny his premises, that the sudden change and the gradual are alike in their effects; and, of course, I deny the conclusion he has deduced from those premises. His conclusion is as follows:—“That, therefore, fever does not arise from mere contraction of the extreme vessels, the diminution of vapour rising from

the body, or the diminution of the exudation from the skin; as these are," he says, "alike produced from the sudden and gradual exposure to cold!"

On the contrary, the effects are very different, for in the one case a sudden check is given both to the small circulating and the exhalent vessels, and thereby an instantaneous and powerful impulse is given to the heart and larger vessels, which, in their reaction, manifest great and increased excitement throughout the whole system. As in the febrile excitement produced in those cases which so frequently occur from the use of cold water, when the body has been previously excited by heat and spirituous liquors. At first, there is a shock of the nervous system, then excitement of the vascular, producing an engorgement of the brain, &c. In other words, fever is the consequence; but this is not the case where cold is gradually applied.

Nothing is more commonly known, even in this climate, than the fact that plunging into the river, when the body is heated, is an exciting cause of fever; exposure under similar circumstances to a shower of rain, operates in the same way. In every hot season, facts of this nature present themselves to the practitioner in this city, showing the effects of a sudden check to the discharges which so usually occur in such season, especially when an additional impulse is given to the circulation by exercise. Yet he considers his reply as furnishing an ample refutation of the doctrine he opposes, when he says, "that cold operates by its contraction and obstruction of the extreme vessels, whether suddenly or gradually applied; and that, as fever in the latter case is not produced, so it is not in the former!"

To my mind, the explanation here given, appears more satisfactory, viz. that the body being previously excited, the sudden exposure and change of temperature, account for the phenomena produced.

Dr. Fordyce also observes, that the effect of sudden exposure to cold, is to produce other diseases, but not fever; and that one hundred other diseases, as the phlegmasiæ, are produced for one of fever by that cause! This may be, and probably is true, in a cold climate, but it certainly is not true in a hot one.

Again, he remarks: "If a man when fatigued is suddenly exposed to cold, the exposure is much more frequently followed by disease, and particularly by fever," p. 138; and adds, by way of illustration, "if a man has been in a crowded assembly, where his attention has been strongly excited, and comes suddenly out into the cold air; or if he has been fatigued by exercise, if he should throw himself into cold water, there are many instances of fever having immediately ensued." Here, then, he admits the effects of cold suddenly applied, producing fever; but qualifies it by premising fatigue, dancing, or other exercise, to put the body in a state to be acted upon by cold, to produce fever. I ask, where is the difference between the excitement given to the system by fatigue, or by exercise, and that communicated by the climate? You will all answer—certainly none.

This question answered, I again ask, is it not more consonant with facts and correct reasoning, to say, 1st, that in a cold climate, when the body is heated by exercise, by intemperance, or any other cause, and then suddenly exposed to cold, fever, and especially the phlegmasiæ, are produced. That in a hot climate, such sudden exposure, in the habit of body debilitated by the heat of climate, and other causes, will generally produce fever; and again, that where the habit is vitiated, in other words, a putrescent tendency of the fluids exists, as from bad diet, impure air, and other causes, it will produce fever that readily assumes the typhoid character. In the one case, the effect produced may be considered in some degree as merely a mechanical check or interruption to the discharges of the body; I mean the effect of cold in producing the phlegmasiæ. But in the other case, where the fluids of the body have a septic tendency from climate, diet, or any other cause, a chemical action is united with, or added to, the constriction of the vessels, to produce the more compound effects upon the system, viz. typhus fever. Such, at least, is the conclusion I have been led to upon this subject, after a very careful examination of the facts, and the most correct reasoning I can bestow upon them.

I also observe, that upon the sudden application of cold to the body in producing fever or febrile diseases, such is the connexion of nerves throughout our machine, that it is not ne-

cessary that the whole surface of the body be exposed to the action of cold. A snowball, or a cake of ice, applied to the scrotum, we know by the constriction it produces, will check a bleeding vessel of the nose. Cold, in like manner, applied to the feet, will excite the action of the bowels, by checking the flow of fluids to the surface of the body; and in this way, we know that obstinate constipation of the bowels has been, in some cases, cured. See *Med. Essays of Edinburgh*. So, in like manner, will a partial stream of air, received upon the neck, or poured into the lungs, produce either one of the phlegmasiæ, or a fever, according to the circumstances of climate, or the condition of body.

4th. *Moisture* is an exciting cause of fever. A moist atmosphere, we know, predisposes to inflammatory diseases, as croup, pneumonia, and phthisis, by its action more especially upon those organs which are the seat of those diseases. But how does moisture operate, as an exciting cause, in producing fever? Both by relaxing the whole system, and by abstracting our caloric. And as our heat is constantly carried out by our secretions, as a vehicle, and still more abundantly by the conversion of that fluid into vapour, by which the temperature is diminished; so moisture, when constantly applied to our bodies, in a similar manner abstracts our caloric and reduces our temperature, and with it impairs the functions of the system. As it regards its operation upon the body, moisture may be resolved into cold, for it produces the same effects: for, by the application of moisture to our bodies, we lose our heat in the same manner as it is carried off by the fluid of perspiration or sweat.

Fordyce does not appear to understand this subject. In page 148 he observes, that the operation of moisture on our system is not very clear:—to him it certainly is not, for chemistry never received from him that attention which should be given to that highly interesting branch of science by every physician.

As I have already remarked, the fact is familiarly known, that evaporation produces cold, agreeably to the first law governing the communication of heat, viz. that all bodies passing from a denser to a rarer state, absorb caloric, as illustrated by Dr. Cullen, in his excellent paper on cold. As before remarked, we observe its effects in the process of cooling liquors

in a hot climate, by means of evaporation. We experience it in cooling the air of a house, by wetting the floors; and the same effects are observed in the change produced in the temperature of the air after a shower of rain.

In like manner, our heat is carried off by moisture, both as applied to our bodies, and flowing from the surface by perspiration. Indeed, this discharge being excessive, even cold sweats, as they are denominated, are produced; for we frequently find the perspiration out of all proportion to the previous excitement of the arterial system, and entirely the consequence of a relaxed, exhausted state of body, and of course a relaxed condition of the excreting vessels. Under these circumstances, the stimulus so necessary to health being withdrawn, (even though gradually withdrawn,) great exhaustion and debility follow—sometimes death itself. But the effect of the sudden and temporary application of cold to the body is exciting to the system, especially if in the vigour of health. Not so the continued application of cold or moisture. Standing immersed in water—remaining in wet clothes, or clothes put on wet or damp—sleeping in damp sheets—a wet greatcoat, even though the body be covered with dry clothes underneath,—all these chill us, by abstracting our heat, and thereby arresting the circulation in the smaller vessels. We hence see the propriety, when not in exercise, of throwing off our greatcoats when wet, even though we may have dry clothes beneath. Although we may, by the non-conducting media of cotton or flannel, guard ourselves, under ordinary circumstances, yet these are not always sufficient to prevent the abstraction of our heat; such is its ready union with moisture, its natural conductor. Cold and moisture in this manner, and in a septic state of body, become an exciting cause of scurvy. Otherwise, even though the system be affected by the diet, exercise, and warmth, it will frequently escape that disease;—not so when idle, and lodged in a damp and cold atmosphere. See Capt. Parry's Voyage. According, then, to our condition of body as to strength, and the power of restoring the circulation, and with it the heat, and thence the power of resisting disease; and according to our predisposition at the time—inflammatory complaints, such as rheumatism, and the various forms of cynanche and pneumonia, are, or are not produced.

In like manner, depending upon the state of our fluids in connexion with the debility of body, from fatigue and intemperance, fevers of a mild or a malignant character are produced. The Walcheren fever, (see the account of it given by Davis,) which cut off so many of the British troops in the summer and autumn of 1809, and which occasioned the failure of the expedition to Zealand, was thus engendered by these combined causes—the moisture, miasma, influence of season, intemperance, bad diet, and other circumstances usually met with in large armies.

The malignant fevers of Flanders, the Netherlands, (Holland,) and the malignant fevers of Batavia, are also in the same manner to be accounted for. Batavia, in a remarkable degree, unites both moisture and miasma; for the Dutch, by cutting canals through it, have made another Holland of it. Indeed, in consequence of this union of moisture and miasma, Batavia is more unhealthy than Holland. The greater heat of Batavia, too, is another predisposing cause of the more violent and fatal fevers of that country. So, in like manner, the fens of Lincolnshire, and indeed the marshes of all countries, are unwholesome, in consequence of this noxious union of miasma with moisture; while the banks of the Thames, or the Seine, are comparatively healthy. Hence, too, the fact that running water, sea water, and river water, (which emit no miasmata,) are less injurious than the water of stagnant pools or marshes.

A fact illustrative of this distinction was communicated to me some time since, as occurring during the last war. Three hundred sea-fencibles were stationed at Fort Diamond, at the Narrows, two or three hundred yards from the shore. Although not exposed to moisture from the soil itself, yet the barracks were so bad that they were drenched by every shower of rain. They enjoyed good health, and were free from fever; not a man died in five months. Here they were exposed to moisture alone. In October and November, 1814, a brigade of troops were stationed at New Utrecht, some in barracks, others in tents; but both in the excavation of a hill, that afforded a large receptacle for the rain that fell. These troops, in consequence of this lodgment of rain, became the subjects of typhus fever, and a considerable number were destroyed. Again: a company

of riflemen was also stationed in the sandy beech below, in barracks, situated at the bottom of a high bank. Among these, only two or three cases occurred, but none of which proved fatal. No lodgment here took place either of rain or moisture from below, for the sandy bottom readily conveyed it off as fast as it fell.

Similar facts are stated by Sir James Fellowes, in his work on the Walcheren fever. He remarks, that many cases of fever were induced by the men remaining out in the evening air, smoking their pipes under the trees, with their bodies frequently exposed by taking off a part of their dress; while others more prudent were sheltered, and remained in health. p. 343. He also states, that the practice of taking out the troops to exercise before sunrise, was attended with fatal consequences, from exposure to the damp and noxious exhalations.

But, as I have before observed, fevers are, in some instances, produced by moisture alone. During the war which took place in Flanders, between 1710 and 1711, an army was encamped upon sandy ground, in which water was found in digging less than a foot deep. Upon digging the wells the air immediately became loaded with moisture, and in a few days fevers were produced in great numbers, although the army was healthy before; and upon changing their grounds (see Fordyce, p. 147,) no more fevers were produced. The predisposition to fevers, in such case, was to be presumed as existing among the soldiers. Moisture, abstracting their heat, would not only debilitate them, but would necessarily produce a similar constriction upon the exhalent and small circulating arteries, which we have noticed from cold when directly applied to the body.

I have seen the same effects occasioned by moisture in the state prison, after wetting the floors, which was done once a week, and without removing the prisoners from the apartment while this process was performed. The consequences were, remitting fevers, the phlegmasiæ, and, in some instances, diarrhœa—analogous to the effect of throwing cold water upon the extremities in cases of constipation of the bowels. In the same manner, rock-blowers and well-diggers, being constantly immersed in water, are affected with rheumatism; and a compound of palsy and rheumatism of the lower extremities, called

berbiers; so called on account of their hobbling gait, resembling the motion of a sheep.

5th. Another exciting cause of fever is *our food*. It may prove so in various ways.—1. Food may be an exciting cause of fever, as it is of nervous affections, from being indigestible. In this case it may create, by its operation upon the stomach and intestines, considerable excitement throughout the system, that is otherwise predisposed to fever. 2. The excessive use of animal food, in a hot climate, or in hot seasons of the year, produces a putrid state of the bowels. In this way not only dysentery is produced, but by the operation of that food the whole mass of fluids becoming tainted, other fevers of a malignant character are the consequences. Fish, oysters, eggs, as well as other animal food, may thus become the exciting causes of fever, as they readily run into the putrefactive fermentation. Animal food, too, in like manner, becomes an exciting cause of a relapse, when too early employed during convalescence from fever, especially the typhus form. Of the malignancy of the fluids, occasioned by the excessive use of salted animal food, we have already spoken; particularly as producing a scorbutic state of body, and thereby especially predisposing the body to malignant fevers.

6th. Another exciting cause of fever is, concentrated *human effluvia*. Even in the individual, neglect of the bowels, in the summer season, creates a febricula, manifesting itself by the furred tongue, hot hands, burning feet, thirst, headache, and a frequency of circulation. These neglected and long continued, are soon followed by a more formidable attack of fever. In this way dysentery and typhus fever are frequently engendered in the individual, as well as in the congregation of a great number of individuals, as in a jail, a ship, or a hospital. In the latter cases, the excretions of the surface, and some others still more offensive, are not unfrequently additional sources of filth, and thereby become the exciting causes of fevers. In the individual, too, in whom an obstructed liver exists, typhus fever is frequently engendered by the obstruction of the bowels, from the want of the natural cathartic.

7th. *The passions of the mind* are among the exciting causes of fever. Case of Mr. B—— G.;—he had an intermittent—

was free from it—he lost a great quantity of blood from the nose; the fever was not renewed by this hemorrhage, nor did a diarrhœa afterwards renew it; but his mind becoming agitated by the sufferings and pain, and the screams, of his brother during an operation, immediately renewed his fever, by the irritation it communicated to his nervous system. This shows that irritation, and not debility, is the source of fever: otherwise, his exhaustion from hemorrhage and diarrhœa would certainly have renewed it.

LECTURE XIV.

CAUSES OF FEVER.—MIASMA AND CONTAGION.

THE eighth exciting cause of fever, is the *miasma* of marshes.

Marsh miasma produces both intermitting and remitting fevers, depending upon the condition of body, the nature of the climate, season of the year, and the quantity or degree of concentration in the miasma. In the most healthy seasons in the island of Jamaica, and the other West India islands, intermittents are produced. Again, as the season is hot, there is a tendency to the continued form of fever, or to a less perfect intermission. In winter, again, the intermittent character returns.

It is certainly very extraordinary, that although the insalubrity of swamps and stagnant waters was well known, and was noticed even by Hippocrates, Galen, Varro, Columella, Palladius, Vitruvius, Diodorus Siculus, Dionysius Hallicarnassensis, Strabo, and others, Sydenham should not have known or suspected that intermittents or remittents arose from marsh miasmata. He acknowledges he tried in vain to find out why seasons, apparently similar, should have such dissimilar effects on the human frame. Yet so it is, he says: “Ita enim se res habet;” and adds, “variæ sunt nempe annorum constitutiones, quæ neque calori, neque frigori, non sicco humidoque ortum suum debent, sed ab occulta potius et inexplicabili quadam alteratione in ipsis terræ visceribus pendent, unde aer ejusmodi affluviis contaminatur, humana corpora huic aut illi morbo addicunt determinantque.” De Morb. Epidem. c. ii. p. 41.

In these various effects, you perceive an operation analogous to the effects of cold air in cold climates and cold seasons, producing the phlegmasiæ;—and of the dews and cold night air in hot climates and hot seasons, producing fevers; while the same causes in a vitiated habit of body produce typhoid or malignant fevers.

Lancisi, who lived from about the middle of the seventeenth century to the beginning of the eighteenth, (he died in 1720,) was one of the first accurate observers on the subject of marsh miasma.* In the *Med. and Phil. Register*, vol. i., you will find a faithful translation of his valuable work, by the late Lieutenant Governor Colden, who was a learned physician. In *Bruce's Travels*, you will also see an account of the disease produced by the same effluvia, when exhaled from the mud and marsh left by the waters of the Nile after the inundation. The remittent fevers of Bussorah are in like manner induced after the inundation occasioned by the Euphrates. Indeed, in some cases its banks have been intentionally destroyed by the Arabs, in their hostility to the Turks of Bussorah. The deserts in the neighbourhood being overflowed, stagnant water is the result, filled with putrid fish, and decomposed animal and vegetable matters of various kinds; the effluvia from these produce remitting fevers of the most malignant type. Twelve or fourteen thousand inhabitants have been thus swept off by the fevers occasioned by a single inundation in that hot country. For an account of the Bussorah fevers, see *Transactions of the Medical and Chirurgical Society for 1793*. See also *Wilson*, vol. i. p. 84. In the 2d vol. p. 192, lately published of the same *Transactions*, you will also find an interesting description of a similar malignant remittent occurring in Portugal; and of the fever of the East Indies, or jungle fever, as it is called.

Miasma in our own climate, and in all temperate latitudes, exists most abundantly in the autumn. The system is then more disposed to be acted upon, the habit of body being at that

* Lancisi (*de nox. paludum effluv.*) He gives a remarkable instance of the hurtful quality of the air of putrid marshes. Thirty gentlemen and ladies, of the first rank in Rome, had been sailing upon a party of pleasure, towards the mouth of the Tiber. Upon the wind suddenly shifting and blowing south, over the putrid marshes, twenty-nine of the thirty were immediately seized with a tertian fever—one only escaping.

time relaxed and debilitated, in consequence of the heat of the preceding summer :—and we may add that the body is also, by the action of the same causes, in a more vitiated state. Observe, that the vitiated habit gives malignancy to fevers, but not susceptibility, or at least this is less certainly the case. And indeed, upon some occasions, it would appear that the deleterious action of such vitiation upon the nervous system has a contrary operation, that of rendering the system less liable to be acted upon by some of the exciting causes of fever, particularly contagion; for the stranger is certainly more susceptible of yellow fever than the native. We are at that time, therefore, as a consequence of the debility and relaxation occasioned by the summer's heat, more susceptible of the operation of the miasma of autumn. This predisposition, however, may be counteracted by generous living, but not by water-drinking or a vegetable diet, but by the moderate use of wine, and a due proportion of animal food.

An illustration of this is afforded by the case of some friends of mine, living in Duchess county. Two of them are water-drinkers, and they frequently have the fever of that region. Two others, living in the same neighbourhood, who drink good old Madeira, have always escaped.

In autumn, too, from the causes which have been mentioned, such is the predisposition, that the intermittent readily becomes a remittent, and the remittent not unfrequently assumes the typhoid character. Such was the case with one of the water-drinkers just referred to, in 1812. His disease began as an intermittent; it soon became continued; and finally ended in typhus. His nervous system became very much impaired, showing itself in his mind and body, for many months after an attack of fever thus induced.

Miasma no doubt operates as a ferment upon our whole system, having its peculiar laws, like every other poison introduced. As marsh miasma is the result of the putrefaction of vegetable matter, Dr. Hugh Williamson, in his very interesting account of the fevers of North Carolina, contained in his history of that state, considers even the most simple species of intermittent as in some measure the effect of a putrefactive taint introduced into the system; especially, as he observes, the most putrid fevers arise from the same cause; that is, that in this

country the heat of the climate contributes to this effect by its predisposing action on our system. Hence, too, it happens that intermittents in this climate, in common with all hot latitudes, have a great tendency to assume the continued type, and thence to end in a typhoid state of the system. To the same cause it is owing, that even the inflammatory diseases of winter in that climate have the typhous tendency, and will scarcely admit of the lancet. Hence, too, the typhous termination even of the intermittents of that country, as observed by Dr. Williamson.

This leads us to inquire, what are the circumstances favourable to the operation of marsh miasma? They are, 1st, moisture.—Troops occupying the lowest situations, have been always observed by army physicians to be most liable to the influence of miasma. In the island of St. Lucia, it has commonly been remarked, that when the garrison, in a lofty position, is healthy during the time of dry weather, the inhabitants of the town at the base of the same hill, immediately below, and within half cannon shot, are visited by the worst fevers. *Medical and Chirurgical Transactions* vol. viii. p. 132. Even the smallest eminences, by their relative dryness, though equally exposed to the miasma, are observed to afford some security against its effects. The ground floor of the same building or barrack, is more unhealthy than the upper apartments. Hence, too, as observed by Sir J. Pringle, the cottage is less healthy than the town. The same author, in illustration of this fact, states the situations of two battalions: one was in a town remarkably healthy; while the other, in a cottage, was, in consequence of their comparatively damp situation, rendered very sickly. The same observations have been made by Dr. Brocklesby, by Dr. Donald Monro, and by most army physicians. “The lower and moister the camp or garrison, and the more moist the season, the more subject an army is to agues,” says Monro. See Wilson, p. 85. We may add, that this usually arises in consequence of the debilitating effects of cold in this instance.

The effluvia of marshes, it may also be observed, are worse, and more virulent in their effects, when the water is drained off. As at the Nile, fevers are not prevalent during the inundation, but afterwards become so; at the same time that they are more malignant. The same thing was observed, after the

overflowing of the Tiber. Baglivi, *Op. Omn.* p. 51, the great Roman physician, observes: "*Certa Romanorum observatione constat, post ingentes Tyberis inundationes oriri febres epidemicas in urbe valde graves ac perniciosas.*"

I have observed the same thing to occur at Newtown, Long Island; that after the waters of the creek that puts up from the arm of the sea which passes between us and Long Island, improperly called the East River, has retired after an uncommonly high tide, a great quantity of matter was left bare, from which an exhalation arose, loaded with the poison of a very formidable remittent and typhus fever. A similar observation has been made by Dr. Rollo, at St. Lucia. Intermittents occurred during the rains, but remittents after the waters were drained off.

It is well observed by Melville, in his *Experimental paper* in the *Edinburgh Literary Essays*, "that light only communicates heat when its rays are obstructed, reflected, or refracted." This obstruction or reflection does not take place so readily when the ground is overflowed with water. The water being clear, will not become readily heated in such case, as the rays of the sun are not so readily reflected. Of course, the putrefactive process is less perfect and extensive, as the sun has not the same effects on the earth, the reflection of its rays being less powerful.

But moisture alone will produce agues. They are frequent, says Dr. Moseley, in rainy seasons, when there is no miasma to produce them. "Agues," says Dr. Lind, "occur in the most healthy parts of Great Britain," i. e. from the moisture of the climate, without miasma. But it is by all admitted, that they are certainly most frequent in the fenny counties of England. Yet, though moisture favours the action of miasma and the putrefactive process that begets it, it is not essential to the production of fevers. For at Newtown, Long Island, and in most parts of this island, those diseases have existed—in seasons, too, of the greatest drought. I have known families residing on this island compelled to come to the city, in seasons remarkable for drought, on account of intermittents.

In such cases, there appears to be still a peculiar effluvium exhaled from the soil, i. e. from ground that had been before

marshy—though dry, it will still exhale such effluvia, especially when acted upon by an inordinate degree of heat. A similar observation is made by Livy, lib. v., and by Baglivi, *Op. Omnia*, p. 157. Speaking of marsh miasma, (the malaria of the Italians,) he observes: “*Pestilentia orta sit in agro Romano, ob siccitates et nimios solis calores.*” And we may observe, that in cases of great drought, there is also an early fall of the leaf. May not the decomposition, therefore, of those leaves, aid in the production of such effluvia?

According to Lind, ships at a considerable distance from a swampy shore escape, while those that are near, within a mile, suffer. The first have the moist fog, but the last have the peculiar miasma, combined with that moisture. Dr. Francis informs me, that the crew and passengers of the ship he returned in during the month of August, (1816) all enjoyed good health, until they were exposed to the fogs on the banks of Newfoundland, where they had not only moisture, but the peculiar effluvia blended with it, that proceed from the soil, which in some of the banks is very near the surface. In like manner, Pringle states, that the men-of-war which lay at anchor in the channel, between South Beveland and Walcheren, during the worst period of the distemper that prevailed among the British troops in 1747, were not affected with either flux or fever, but enjoyed the most perfect health. See also Davis on the Walcheren Fever, p. 15.

But although miasma most generally produces intermittent and remittent fevers, and moisture may favour its operation, it is also very certain that the cause of those diseases is, in some instances, generated within the system, but perhaps called into action by fatigue, heat, cold, or moisture. Accordingly, in the city of New York, we have intermittents and remittents at all seasons, winter and summer, as well as in the spring and autumn. Dr. Willan also met with intermittents in persons residing in the most healthy parts of London. See his works, p. 167–8. Dr. Gregory makes a similar observation of their occurrence in elevated parts of Edinburgh, independently of any previous exposure to marsh miasmata. Dr. Bateman makes the same remark. See also *Medical Facts and Observations*, vol. vii. Three cases are noticed by Dr. Beddoes, as occurring at Bristol during a hard frost.

Before I conclude these observations on the effects of moist and marshy situations, let me refer you to a very instructive document on this subject, as it regards their influence on health and life in general, independent of their agency in the more immediate production of fevers. This document you will find in the second volume of Dr. Price's celebrated work on *Annuities and Lives*, exhibiting the proofs of the insalubrity of marshy situations. He observes, (see vol. ii. p. 29,) that the probabilities of living are highest in the most hilly parts of the province, and lowest in the marshy parish, (the parish referred to is a part of the district of Vaud, in the Canton of Berne, in Switzerland, containing one hundred and sixty-nine families, and six hundred and ninety-six inhabitants.) One half of all born in the mountains, live to the age of forty-seven. One half of all born in the marshy parish, live to the age of twenty-five. One in twenty of all born on the hills, live to eighty. One in fifty-two only, in the marshy parish, reach eighty. In the hills, a person aged forty has a chance of eighty to one for living a year. In the marshy parish, his chance is not thirty to one, for living a year. In the hills, persons aged twenty, thirty, and forty, have an even chance for living forty-one, thirty-three, and twenty-five years respectively. In the fenny parish, persons at those ages have an even chance of living only thirty, twenty-three, and fifteen years. See also Priestley's *Observations on Stagnant Waters*, in the Royal Society's *Transactions* for 1774. Also, Murat's *Observations*, published in the *Memoirs* for 1766 of the Economical Society at Berne. See also Simond's *Travels*, vol. i.

2d. Besides moisture, woods are also observed to be favourable to the action of miasma. Pringle, Cleghorn, and Jackson, have all made this observation. They may, and probably do, operate in part by confining the effluvia, and by concentrating their force; whereas light and air otherwise would dissipate and dilute them. On this account, the practice of planting trees very close to a dwelling-house is injurious. But trees or woods may also have an injurious effect by the very moisture which they create, by preventing the access of the sun's rays to dissipate the vapour produced; and its effects are manifest in the early decay of such buildings as are so closely surrounded by trees. Even brick and stone buildings show the effect of such

moisture constantly involving them; the inhabitants, therefore, must experience their ill effects. Yet it is remarked, that woods are, in some cases, useful too, to prevent the bad effects of miasma. The first cutting down and clearing the woods of North Carolina, begot diseases. The historian of that state observes, that the first colony were those who were sent out by Queen Anne, consisting chiefly of the persecuted protestant Palatinates—they did not remain in that part of the country, not getting the lands that had been promised them. The second colony of adventurers lived twelve months in that country before it was cleared, and lost only five men out of one hundred and seven—though badly sheltered and badly fed; but the trees being cut down, and the surface of the earth exposed to the sun, the exhalations, says Dr. Williamson, soon gave rise to fevers.

Woods are also useful, when they are situated between an encampment or a dwelling and marshy ground. Whole families, says Mr. Bartlet, have resided near the Pontine marshes in the vicinity of Rome, and by the intervention of shrubs and trees, have escaped for years the noxious effects of the mephitic vapours which those putrid waters engender. See Thompson's *Annals*. Observations by J. M. Bartlet. See *Edinburgh Journal* for July, 1820, p. 621.

Dr. Williamson, in his late *History of North Carolina*, states a very striking instance of this effect, produced by a piece of wood. A gentleman in Craven county, with a family consisting of fifty or sixty persons, lived forty years without intermittents. But in 1785, he cut down a thick wood for pasture and fresh air—thirteen of his family the next year were attacked with intermittents. Col. Howell's family, too, in New Jersey, was attacked with fever, in consequence of cutting down a wood that separated them from a morass in the neighbourhood. Before that operation, they had been healthy; but the consequence of this change was, that most of the family were attacked with fevers—three died—eight or ten recovered by means of blisters, and the free use of bark, wine, and snakeroot. Similar facts have frequently occurred in the West Indies.

3d. The cold of the night air is favourable to the action of miasmata. All sudden changes of temperature or season give

effect to it, as a cold night after a warm day. "A cold and wet autumn," says Raymond, "after a hot and dry summer, spreads and renders fevers more malignant." Raymond, *Intermittents of Mettleburgh*. See also Wilson, p. 85. Badenock, vol. iv. Obs. and Enq., ascribes the bilious remittents of warm latitudes to the cold night air, as one of the principal exciting causes. Bontius observes, that the worst fevers of Batavia are produced by night air. Lind also states, that the boat of the Medway man-of-war, while at Batavia, attending the shore at night for the purpose of procuring provisions, was no less than three times successively manned, having lost her hands in that service.

4th. Temperate seasons are also most favourable to the action of miasma, viz. spring and autumn. So also are temperate climates, neither very hot nor very cold. Intermittents are accordingly seldom met with very near the Equator. Bontius, Lysons, and Clarke, concur in this remark. In very hot latitudes, if they do exist, they assume a more malignant character, blended with typhous symptoms; and in this way they become contagious, as stated by Cleghorn. See also Wilson, p. 91.

5th. The mixture of sea water with the water of marshes, is said by Pringle to produce a more noxious exhalation than miasma alone. Pringle drew this conclusion from his experiments, showing that a small quantity of salt promotes putrefaction. This is sanctioned, too, by his experiments, for the purpose of showing that salt favours putrefaction; but the dilution more than counteracts this tendency. Accordingly, this is not confirmed by other writers. It is observed by Jackson in Jamaica, and on the coast of the Carolinas, where the sea and river waters are mixed, that those places are not more unhealthy than those where they are separated. It is also a fact, observed at Hoboken, in the vicinity of this city, that it has become very sickly since the sea water has been kept out by embankments. Before these embankments, no intermittents or remittents existed—now they are so frequent and formidable, that many persons have removed to town, to avoid the fevers of that place and its vicinity. Mr. Stevens informs me, that during the summer of 1812, the salt water was again admitted—the marshes as formerly were overflowed, and they en-

joyed an exemption from their usual visitants—intermitting and remitting fevers.

9th. *Contagion* is another of the exciting causes of fever. It is sometimes, like miasma, a predisposing cause of fever, for a person may have contagion in his system, and yet escape disease, unless it be called into action by heat, cold, fatigue, or intemperance. For the most part, however, it is sufficient of itself, as an exciting cause, to produce disease. It is, indeed, the source of a great number and variety of fevers and febrile diseases. The term contagion is derived from the verb *contango*, signifying to touch, or to come in contact. And accordingly it signifies, in its strict etymological sense, the communication of disease by contact. Its meaning, however, has been extended beyond these bounds, which the etymology of the term appears to prescribe. A contagious disease in the modern use of the term, denotes a disease in which a specific material is generated in the system, and which excreted, will communicate such disease from one person to another. But notwithstanding the apparent precision of this language, there is, perhaps, no subject which has ever occupied the human mind, that has created more controversy, and more confusion, than that of contagion; especially that of defining the limits and circumstance which characterize a contagious disease. Truly it may be said, that clouds and darkness rest upon it. Some have proposed to confine the term *contagious* to diseases which are communicated by a specific matter, which can be taken but once in the course of life, and which can be communicated by inoculation as well as by contact. And the example they usually give of such specific contagion is small-pox. This they consider the most perfect example of the diseases they denominate specifically contagious. While to fevers that are communicable from one to another, some of which may be communicated by inoculation, as the plague, and may be taken frequently by the same person, they refuse the term specific contagion.*

* "A considerable diversity of opinion has prevailed respecting the cause of fever. Physicians seem now to be agreed in referring it to a general or specific contagion, the former giving rise to typhus in the various forms under which it appears, while the exanthemata or eruptive fevers proceed from the latter." Hamilton on Purgatives, p. 14, 16.

But this distinction, I contend, is a bad one in many respects, even upon their own principles. For instance, syphilis is surely communicated by a specific poison or material—it may be conveyed by the lancet or the knife, as well as by sexual intercourse, and accordingly we see it thus occasionally communicated by dissection. Yet syphilis, although it is thus restrained in the manner of its communication, viz. by contact, you all well know that it is frequently contracted by the same person. Here, then, is at once an exception to the character of a specifically contagious disease, as above defined, inasmuch as the pox may be taken frequently, and the small-pox but once. Dysentery, too, has its specific material as well as small-pox, though it may not be communicated by inoculation. Yet dysentery as uniformly and regularly produces dysentery, as small-pox produces small-pox, though the one can be taken but once, while the other is frequently contracted by the same individual.

The plague, too, has its specific material; it can be taken frequently, and it can even be communicated by inoculation,* as I shall show you to-morrow. Yet it is not, in the sense they consider small-pox, one of the specifically contagious diseases.

Other physicians, again, have confounded all contagious diseases, making no distinctions whatever as to the several modes of communication. Lind even, in his valuable papers on contagion and infection, is guilty of this error.

The late Dr. Richard Bayley of this city, in his account of the yellow fever which prevailed in New York in 1795, proposed what at first view appears to be a plausible distinction between contagious and infectious diseases. He made use of the term contagious diseases, to distinguish those which are communicated under any circumstances of atmosphere, whether foul or pure, as small-pox, measles, &c. Infectious diseases he denominated such as are communicated by the

* It is said that Desgenettes inoculated for the plague some of the French soldiers in Egypt, but could not communicate the disease. But read his own account. He tells you that he did it for the purpose of giving confidence to the soldiers; that he did it under circumstances unfavourable to its communication; made use of the matter at too early a period of the disease; and adds, "that the contagious nature of the plague was demonstrated by a thousand examples—démonstrée par mille exemples."

impurities of the atmosphere, or by the foul air surrounding the patient. That is, that the impurities of the air communicate the disease—not that the air contains any specific material derived from the diseased body, except such as arises from mere want of cleanliness, and from the foul air surrounding the patient. But an obvious objection to this arrangement is, that the same disease under which the patient is suffering is communicated to the visiter. He takes yellow fever, or dysentery, or typhus fever, when the sick man has any of these diseases; and he receives no other.

For this reason, then, I make use of the terms infectious and contagious, as synonymous:—yet each of the disorders so denominated, whether contagious or infectious, has its own peculiar laws. Others, again, are frequently contracted, as the clap and syphilis; indeed, without these peculiarities, they would be the same disease—they would truly be unit, as they have been considered by Dr. Rush and some of his followers, who are without his talents or genius to give the same plausibility to error that it received from that able and eloquent teacher and writer. No one, therefore, can be a standard of comparison for the others, as each disease has something peculiar to itself. Hence, then, we see the error of those who make small-pox a standard—and who pronounce upon the contagiousness or non-contagiousness of fevers and other diseases, according as they do or do not resemble small-pox. In this way they have reasoned upon the contagiousness of yellow fever, denying it altogether because it did not square with the disease they made choice of as the standard—because, forsooth, the yellow fever was not small-pox. They might as well say that scarlet fever is not a contagious disease, because it has not the pustules of small-pox; or, they might say, that even small-pox is not contagious, because it has not the buboes of plague or syphilis. As an old lady, after listening to a learned disquisition on these distinctions, said, “At any rate they are catching diseases.” In like manner, I call them all communicable diseases—communicable from one person to another. But, as some of these diseases are conveyed in one form, and others in a different, we should be careful to mark those circumstances in which they differ, as well as those they possess in common. Can this be accomplished?

Such an arrangement appears to me not only to be practicable, but at the same time calculated, in some degree, to bring the contagionists and non-contagionists together. Under these impressions, in the year 1808, in a letter addressed to Dr. Chisholm, I first suggested my reflections on this subject, and proposed to arrange all those diseases which are communicable from one to another into three great classes, according to the several laws which appear to govern their communication. See *American Medical and Philosophical Register*, vol. ii. p. 17-22.

Dr. Chisholm expressed his approbation of the first two classes, but objected to the third that the foul air which I made the medium of communicating the contagion, and of spreading the disease, only operated by predisposing the body to receive the contagion from the individual to whom he might be exposed, but that it could have no other operation—but this certainly is not all. Dr. Chisholm requested me to reconsider the subject. I have done so: the result of that consideration will be laid before you at our meeting to-morrow.

LECTURE XV.

CONTAGION, AND ITS LAWS.

As I stated to you in the last lecture—in July, 1808, I addressed to Dr. Chisholm some observations on contagion, or infection.* The object of that communication was, if possible, to narrow the ground of controversy upon that important and much contested subject. This I endeavoured to do, first, by showing that the distinction which had been proposed by some late writers, between contagion and infection, was unnecessary and fallacious; secondly, by dividing all diseases which are contagious, infectious, or communicable from one person to another, into different classes, according to the several laws which appear to govern their communication. These classes are three in number.

The first embracing those diseases which are communicated exclusively by contact; as the itch, syphilis, hydrophobia, &c. which are never conveyed through the medium of the atmosphere.

The second including those diseases which are communicable both by contact, or the near approach to the sick, and by the atmosphere, as measles, small-pox, scarlet fever, &c. which are communicable in every season of the year, and in every climate; in a pure as well as in an impure air, though more readily by means of the latter than the former, and with which persons are rarely infected more than once in their lives.

Under the third class are enumerated those diseases which are only, in general, communicable or contagious through the

* See Edinburgh Med. and Surg. Journal, vol. v. p. 247. American Medical and Philosophical Register, vol. ii. p. 14.

medium of an impure atmosphere ; the air being rendered thus impure by the decomposition of animal and vegetable substances, as in low, marshy countries ; or by concentrated human effluvia, as in camps, jails, hospitals, or on shipboard ; but the same diseases I alleged, in a pure air, in large and well ventilated apartments, when the dress of the patient is frequently changed, all excrementitious discharges constantly removed, and attention paid to cleanliness in general, are not usually contagious, or, under such circumstances, are very rarely communicated from one person to another.

In this class I included the plague, dysentery, typhus fever, in its various forms of jail, ship, hospital, or lake fever, and the yellow fever.

I also remarked, that these diseases, like many of the first class, may be repeatedly contracted ; but that they are communicable, or otherwise, according to the condition of the air in which they occur, or into which they may be introduced : it was further observed, that the atmosphere thus impregnated by the peculiar virus emanating from the diseased body, becomes assimilated to the poison or ferment introduced, and thereby is rendered capable of reproducing in others the same specific disease, whether it be the plague, dysentery, typhus, or yellow fever. Such are the outlines of my first communication to Dr. Chisholm.

In 1809, Dr. Chisholm did me the honour to reply* to the foregoing observations, expressing his entire approbation of the first two classes, but objecting to the third. After enumerating his several objections, he requests me to reconsider my third division, which appears to him to be the only objectionable one. This I have done, and now submit the result of a further examination of this subject, and a detail of the facts by which I have been led to my conclusion relating to the laws of communication which I have more particularly assigned to the febrile diseases enumerated in the third class.

In my first communication, I acknowledge I stated my observations without so full a detail of the facts themselves whence my conclusions were deduced, as perhaps ought to have been exhibited. Yet they have been approved and adopted by the

* See American Medical and Philosophical Register, vol. ii. p. 121.

physicians of Edinburgh and London, as you may see in the *Edinburgh Journal*, and the *London Register and Review*. To the European reader, unacquainted with the peculiarities of yellow fever, more especially as it has appeared in the cities of the United States, my first statement may perhaps appear defective in that evidence which is so justly exacted upon subjects of this nature. This evidence I shall now endeavour to supply, and thereby to confirm the correctness of the classification which has been proposed.

Waiving for the present all inquiry relative to the nature or properties of the contagious principles secreted by the diseased body, or the chemical qualities of the atmosphere deemed necessary for its propagation, or the manner in which the contagion diffuses itself, I proceed to observe, that the history of each disease enumerated in the third class, viz. plague, dysentery, typhus, in all its forms, and yellow fever, furnishes evidence of the correctness of the remark, that they are governed by a law peculiar to themselves, that they are contagious or communicable in a foul atmosphere, but that they are never or very rarely so in a pure air, where the sick enjoy the benefits of cleanliness and ventilation.

The same evidence, I trust, will demonstrate another truth, that these diseases are in no instances epidemic, as they have been improperly denominated by most practical writers, but that their sphere of operation is, with very few exceptions, confined within the limits to which the vitiated atmosphere extends, in which they may be engendered, or into which they may be introduced: and that, in this respect, they differ from ordinary epidemics, "which appear in different and distant parts of the same place, and at the same time."

That the plague when once generated, whatever may be the sources whence it derives its origin, is communicated by a peculiar virus secreted by the diseased body, will not, I trust, be questioned at this day. Independently of the facts contained in the writings of Thucydides, Lucretius, Mead, Dr. Patrick Russell, and others, showing the contagious nature of the plague, the communication of this disease by inoculation, as performed by Mathias Deggio,* Dr. Whyte,† and the Russian

* See *Med. Com.* vol. viii. p. 349.

† See *Wilson's Expedition to Egypt*, and *M'Gregor's Sketches*.

surgeon noticed by Sonnini,* have recently established the fact of its propagation by a specific secretion, beyond all possible controversy.

It has been observed by Assalini, that Dr. Desgenettes, while in Syria, had in vain endeavoured to inoculate himself with the virus of the plague: and by the same writer it is incorrectly added, that Dr. Desgenettes made the experiment under the persuasion that the disease was not contagious: but from the account of the facts as stated by Dr. Desgenettes himself, it appears that the experiment was not made under that persuasion. On the contrary, he expressly declares, that its contagiousness was demonstrated by "a thousand examples," and observes, contrary to the opinion of many, that the same person was liable to a second attack of it, as was the case with the convalescents whom he employed to attend upon the sick. Furthermore it appears, from his own account, that he inoculated himself with the matter taken from a person who had the disease in its mildest form, what he denominates the first degree; in which the fever was slight, and the patient easily and promptly cured. Dr. Desgenettes adds, that it was an imperfect experiment, and that it does not disprove the communication of the disease by contagion; and that he made the experiment for the purpose of quieting the fears of the French troops, and of inspiring them with confidence.

But that the plague, in common with the other diseases I have associated with it, is only communicable through the medium of an impure or vitiated atmosphere, is an opinion which, although it has never been attended to by physicians, will be found to be verified by almost every writer on this disease.

1st. The plague of Athens, the first of which we have any authentic or satisfactory account, furnishes evidence of the truth. Whether that disease originated in the city of Athens, or was introduced into it from Ethiopia, the fact is established, that the circumstances under which it appeared in that city were peculiarly favourable to its diffusion. It appeared, according to Thucydides, in the beginning of the summer season, and first of all at the Piræus, the port and harbour of Athens, from whence it spread with increasing mortality into

* See Travels into Greece and Turkey, p. 497.

the upper part of the city. It appeared, too, at a time when Athens was so crowded with those who had fled thither from the adjacent country of Attica for safety from the invading armies of the Peloponnesians and their allies, that many of them were forced to lodge themselves within the turrets of the walls, or wherever they could find a vacant corner. "The city," says the historian, "was not able to receive so large a conflux of people:" "afterwards the long walls, and a great part of the Piræus, were portioned out to them for little dwellings; at the same time, too, the Athenians were fitting out, at the Piræus, a fleet of one hundred ships to infest Peloponnesus." Even the Pelasgic, a hitherto vacant spot of ground below the citadel, which it was thought profaneness to occupy, and the settlement of which the Pythian oracle had specially prohibited, they were constrained, by urgent necessity, to turn into a dwelling-place. By this influx from the neighbourhood of Athens, its number of inhabitants, as stated by a late writer, was suddenly increased from fifty thousand to more than four hundred thousand persons.* In another place, Thucydides observes, "Those who had come in from the country had no houses, but dwelled all the summer season in booths, where there was scarcely room to breathe." He adds, "The pestilence destroyed with the utmost disorder, so that they lay together in heaps, the dying upon the dead, and the dead upon the dying." Even in the public streets, some were tumbling one over another, or lay expiring round about every fountain, whither they had crept to assuage their immoderate thirst. The temples, too, in which they had erected tents for their reception, were full of the bodies of those who had expired there. Thucydides proceeds: "In a calamity so outrageously violent, things sacred and holy had quite lost their distinction; all regulations observed before in matters of sepulture were quite confounded, since every one buried wherever he could find a place." He also observes: "It raged the most, and for the longest time, in Athens, but afterwards spread into the other towns, especially in the most populous, but never extended itself to Peloponnesus." We are told by the same historian, that "at the siege of Potidæa, which took place during the same season, the plague followed

* Medical Repository, vol. i. p. 16.

them even thither, and, making grievous havoc among the Athenians, destroyed the army; and that even those soldiers that had been there before, and had from the beginning of the siege been in perfect health, caught the infection from the troops brought thither by Agnon. After a stay of forty days, having, in that time, lost one thousand and fifty out of four thousand men, he returned with his ships to Athens.”*

With these facts before us, the season of the year in which the plague made its first appearance, the part of the city in which it commenced, the multitudes which crowded into it, and those too unaccustomed to the air of the town, having been habituated to active employment in the pure air of the country, the impure state of the atmosphere necessarily resulting from this condition of things, combining the evils both of pestilence and war; the disease itself being confined within the walls of the city, while, at the same time, it never extended itself to the neighbouring country, not even to the contiguous towns of Peloponnesus and Bœotia, we are led to the conclusion, at least to the strongest presumptive evidence, that an impure atmosphere is the vehicle or medium by which this disease is propagated.

2d. The circumstances attendant upon the plague, as it has appeared at different periods in the city of Rome, are no less demonstrative of this truth. I will only notice the more remarkable visitation of this disease which took place in the year of Rome 290, and four hundred and sixty-one years before Christ. “This,” says Livy, “was a season of great distress; for during this year a pestilential disorder spread itself not only through the city, but over the country, affecting both men and cattle with equal malignity; the violence of the disorder was increased by admitting into the city the cattle and the inhabitants of the country, who fled thither for shelter from the enemy’s ravages: such a confused collection of animals of every kind suffocated the citizens by the unusual stench, while the country people, crowded together in narrow apartments, suffered no less from the heat, the want of rest, and their attend-

* Smith’s Translation of Thucydides, vol. i. p. 153.

ance on each other; besides even contact served to propagate the infection."* Baker's Livy.

Dionysius of Halicarnassus mentions† that the disease seized studs of mares, herds of oxen, and flocks of goats and sheep, doubtless denoting that this disease was remarkably fatal to those animals when collected in numerous bodies. Orosius, in his account of the same pestilence, observes, "Many of the patricians were victims, but it was most fatal to the poor."‡ Livy also has a similar observation, that many illustrious persons died, but that among those of inferior note the virulence of the disorder spread its ravages wide.

3d. The history of the pestilence of modern times, the accounts of which are more minutely and satisfactorily detailed, no less proves that this disease, when once introduced, spreads its devastation by means of a vitiated atmosphere, more especially where such vitiation proceeds from confined human effluvia. Erasmus, in 1515, in a letter to Franciscus (Wolsey's physician) ascribes plague, and the sweating sickness, partly to the incommodious form and bad exposure of the houses, to the filthiness of the street, and the sluttishness within doors. "The floors," he writes, "are commonly of clay, strewed with rushes, under which lies unmolested an ancient collection of beer, grease, fragments, bones, spittle, excrements of dogs and cats, and every thing that is nasty," &c.§ Diemerbroek also remarks, in his excellent treatise on the plague, that whenever that disease has been introduced out of its proper season it has not spread. It has also been observed by Dr. Russel, that in winter time, when infected persons have come to places about Aleppo, some of whom have died of the disease in families where they lodged, the distemper was not propagated. Dr. Hodges also stated that those who fled from London, in the

* Grave tempus et forte annus pestilens erat urbi, agrisque, nec hominibus magis, quam pecori; et auxere vim morbi tenore populationis, pecoribus agrestibusque, in urbem acceptis. Ea colluvio mixtorum omnis generis animantium, et odore insolito urbanos et agrestem confertum in arcta tecta, æstu ac vigillis angebat, ministeriaque in vicem ac contagio ipsa vulgabant morbos. Tit. Liv. lib. 3. c. 6.

† Lib. 10.

‡ Lib. 2.

§ Life of Erasmus by Laycey. Lond. 1805.

autumn of 1665, during the ravages of the plague, and returned in winter time to the houses and beds in which their friends died of the malady, escaped the infection. It therefore depends both upon temperature and the condition of atmosphere for its propagation.

It is likewise an unquestionable fact, says Dr. Bateman, writer of the article Plague, (see Rees,) that this disease has always first appeared and established its head quarters in the filthiest parts of crowded, ill-constructed, and large cities, and has committed its most fatal ravages among the lowest of the people. Thus at Grand Cairo and Constantinople it appears almost annually.

In London, Dr. Heberden observes that the plague of 1626 and 1636, broke out at White-Chapel, a part of the town which abounds with the poor and with slaughter-houses. In the plague of London, in 1665, at which time nearly one hundred thousand persons perished, it is stated to have broken out first at St. Giles's. We are also told by Hodges, that while the better sort of people had various resources to avoid the dreadful consequences of this fatal distemper, it was entirely confined to the poor, insomuch that some gave it the name of the poor's plague.

The rich, says Mr. Howard, are less liable to the plague than the poor, both because they are more careful to avoid infection and have larger and more airy apartments, and because they are more cleanly, and live on better food, with plenty of vegetables; and this I suppose is the reason why protestants are less liable to this distemper than catholics during their time of fasting; and likewise, why the generality of Europeans are less liable to it than Greeks, and particularly Jews. He adds, I have heard of instances of servants in European families, who, through imprudence and carelessness, have been attacked with the plague, while the rest of the family escaped it.*

We are told by Diemerbroek, that it was a common practice in Italy and France, when the plague appeared in any large town, to drive out the poor immediately: so fully were the magistrates convinced that the disease was preserved and propagated by them. Upon the same principle, at the commence-

* Account of Lazarettos, p. 52.

ment of the plague at Marseilles, all beggars were ordered to quit the town.* “Indeed,” says Dr. Blane, “it is a general remark in the history of all plagues, both in Asia and Europe, that they break out and prevail only among the lowest and poorest ranks of people, never becoming epidemic among the better sort.”† When the plague was last in England, upon its first entrance into Poole, in Dorsetshire, the magistrates immediately suppressed it by removing the sick into pest houses without the town.‡

Lord Clarendon, in the history of his own life, relates that when he and other people of condition, who had fled from the plague, returned to London, they hardly missed one of their friends or acquaintances, the mortality having been confined almost entirely to the lowest orders of the people. “At that time, too, the streets of London,” says Thornton, “were narrow, crooked, and incommodious, the buildings chiefly of wood, dark, close, and ill contrived, and by the several stories projecting beyond each other as they rose over the narrow streets, the circulation of the air was almost entirely obstructed. To these inconveniences,” he adds, “may in some measure be attributed the destruction which had been repeatedly made in the city by the visitation of the plague; for as the air was confined, so the noisome vapours and pestilential atoms were harboured and nourished. Though the destruction of London by the great fire in the succeeding year (1666) occasioned great temporary distress, yet, in the end, it proved of the utmost utility; for, by the rebuilding of the city, and the enlargement of the streets, the free circulation of air was admitted, the offensive vapours expelled, and the city freed from all pestilential disorders.”§ It is also stated by Dr. Hodges,|| that at the breaking out of this plague, the city was unusually full of people: he supposes that there must have been upwards of one hundred thousand persons more than usual in the city; and according to Dr. Baynard, during the progress of this merciless pestilence, there was such a general calm and serenity of weather as if

* Ferriar’s *Med. Hist. and Reflect.* vol. i. p. 287.

† *Diseases of Seamen*, 3d ed. p. 622.

‡ *Robertson’s Med. Police*, vol. ii. p. 149.

§ *Thornton’s History of London*.

|| *De Peste*.

both wind and rain had been expelled the kingdom, and that for many weeks together not the least breath of wind could be discovered.

It is also worthy of remark, that the city of Oxford, to which the parliament was removed during the prevalence of this disease, remained uninfected; which exemption is ascribed, by Dr. Plott, to the draining and greater cleanliness of that city.*

4th. The great plague with which Marseilles was visited in 1720, and which destroyed upwards of sixty thousand of its inhabitants, presents us with a detail of facts which leads to the same conclusion. Blackmore takes notice, that the impurity and filth connected with the galleys and slaves at Marseilles, filled the air with offensive smells, and in 1720 the plague broke out there in a part of the town thronged by the poorest people. This disease, it is well ascertained, was introduced from the Levant by a ship which arrived at Marseilles from the coast of Syria. It appeared first among the sailors of the suspected ship; it was next taken by the porters engaged in opening and airing the merchandise in the Lazaretto; it was then introduced into the city, and spread among the poor, and first of all in a street which was only occupied by the lower class of people.†

In the commencement of the disease, Bertrand remarks, none but children and poor persons were attacked by it.‡ In a short time it extended to the neighbouring streets; it was also conveyed into the Hotel Dieu, by a person received as a patient from the street where the distemper first broke out; two of the nurses and the matron of that institution first died of the disease, when the infection spread with great mortality, destroying the physicians,§ surgeons, apothecaries, confessors, and all the other officers and servants of the house, with the whole of the poor in the hospital, including above three hundred foundlings.||

Soon after, all intercourse was prohibited between the town and neighbouring country; the scarcity of provisions which ensued, independently of the crowded state of the city, greatly

* History of Oxfordshire.

† Bertrand's *Rélation Historique*, p. 414.

‡ Bertrand, p. 50.

§ Speaking of the plague of Egypt in 1800 and 1801, Sir James M^cGregor tells us, that of thirteen physicians seven were attacked with the disease, and that of this number four died.

|| Bertrand, p. 92.

added to the mortality of the disease: the number of the sick increasing, an hospital was opened for the reception of the infected, where the disease proved fatal to all the attendants. But the disease was not only propagated in those public institutions, where great numbers were crowded together, and in the confined dwellings of the poor; other circumstances occurred which served greatly to diffuse the poison still more generally throughout the city. According to Bertrand, the streets were crowded with "the sick, the dying, and the dead," and the vapours which arose from the putrid dead bodies, in every part of the city, served to infect the air and spread the contagion; indeed, it soon extended to places that before this had been inaccessible to it; monasteries, and houses shut up in the most exact manner, were no longer places of security; the whole city became more or less one infirmary.*

The infection, too, was very much increased from another source not less dangerous. An opinion prevailed that the dogs received the contagion from contact with infected clothes, and thereby became the means of spreading it still more extensively; the consequence was, an order to destroy them: in a few days the streets were strewn with their carcasses; a prodigious quantity were thrown into the water; these also were soon cast upon the shore, where, by the action of a hot sun, the air was filled with the most noxious vapours. Infected clothing and furniture were also continually thrown into the streets from the windows of the houses in which the disease prevailed; and, if possible, still further to give wings to the poison, fires were injudiciously had recourse to, for the purpose of destroying the infection. "At hours appointed," says Bertrand, "the whole city appeared on fire, and the air became loaded with a thick black smoke, better calculated to retain than to dissipate the contagious vapour."† In fact, these fires, he adds, appeared to relume that of the contagion; "they heated the air, already rendered suffocating by the heat of the season and climate; the pestilential poison became more active, and the disease acquired new force."‡

5th. The plague of Aleppo, in 1760, 1761, and 1762, might also be cited upon this occasion, as well as many others, both

* Bertrand, p. 145.

† Ibid. p. 74.

‡ Ibid. p. 75.

anterior and subsequent to that period, to show that the epidemic influence of this disease is chiefly dependent upon the atmosphere into which it may be introduced.

6th. I cannot however pass over without comment, the plague which the British and French troops suffered during the celebrated expedition to Egypt in 1800 and 1801, inasmuch as it will show that this disease, even in its native climate, is governed by the same laws of communication which have been observed when it has been introduced into other countries.

We are accordingly told, by the learned Dr. Wittman,* "that the disease is more prevalent at Rosetta than in any other town, or part of Egypt;" he adds, "the streets of Rosetta are extremely narrow and very dirty. The crowded manner in which the inhabitants live together would appear sufficient, in a stagnant state of the atmosphere, in most of their towns, to generate pestilential or malignant diseases. The very few comforts and conveniences which fall to the lot of the poorer class of the natives of Egypt, by far the most numerous, would lead one naturally to expect great mortality when the plague prevails among them. Dreadful examples are seen annually to happen." In another part of the same work, he is still more explicit on this point, showing that the plague "does not always possess the same activity and force;" and the necessity, as he expresses it, of some "powerful agent to put the contagion into action, and give it its full force." He then asks, "May this agent reside in the atmosphere? Does this peculiar constitution of the air consist in a superabundance, or diminution, of the ordinary proportion of oxygen in the atmosphere? or in the combination of some peculiar gas or gases diffused in it?" He suggests that a series of eudiometrical and other observations, continued for several years, might throw some light on this subject. "Time alone," he adds, "may unfold this mystery."† But when we take into view the facts he has already stated relative to Rosetta, and are told by the same author that in Egypt the plague prevails when the Nile is low, and of course the air loaded with impurities thence arising; that at Constantinople, the cold weather, in winter, puts a period to its progress; and the still more general observation, that the ex-

* Travels in Egypt, p. 525.

† Ibid, p. 533.

tremes both of heat and cold are unfavourable to the propagation of plague;—these facts, in connexion with those already stated of this disease, as it has appeared at different times and in different parts of the world, are certainly calculated to dissipate much of the mystery in which this subject has been enveloped. The remarks of Dr. M'Gregor, (now Sir James M'Gregor, principal of the medical staff,) that the plague varies its type according to the state of the air, and other circumstances, and that by ventilation, fumigation, and attention to cleanliness, the progress of the disease was arrested,* also serve to confirm the correctness of the view which has been taken of this subject. Even the writings of Assalini, who disbelieves the communication of this disease by contagion, furnish additional support to the principle here contended for; for he admits that when persons are shut up and crowded together in infected places, the disease is readily contracted.† In another place he observes, “that if a person be exposed to breathe the infected air in the chamber of a patient, or should he stay too long in the same atmosphere, he will run a great risk of contracting the prevailing malady.”‡ He moreover proceeds; in order to prevent all suspicion, and avoid all danger of carrying the disease where it has not been before, that they should take nothing with them but the necessaries of life; they should avoid, as much as possible, halting in villages; and each time when they happen to encamp, they should expose their baggage and clothes to the air, which would not fail of dispersing every particle of contagion. As a further evidence, too, of the connexion between the prevalence of the disease and the state of the air, he remarks, that during the epidemic, “the inhabitants residing near the sea were more exposed than those who were at some distance, and that there were several villages situated on the heights which had not even a single sick person.” In many other parts of his work, he shows that his mind was not totally divested of belief in the communication of the plague by contagion; and when danger approaches, like some modern professors of religion, he proves himself to be the practical infidel, by distrusting even his own doctrines; for he takes great

* Med. Sketches, p. 111.

† Observations sur la Peste.

‡ Observations, &c.

pains to inform us of the various means he made use of to protect himself against the disease, and which are both as efficient and judicious as the most sturdy contagionist could possibly have employed. Imlac, in *Rasselas*, speaking of the appearance of departed spirits, says, "Some who deny it with their tongues, confess it by their fears." So with Assalini, and, indeed, the same may be said of many others who affect to disbelieve the doctrine of contagion, but who are among the first to fly from the disease whenever it made its appearance in our cities. And they were the first to write on this subject; and wrote the most. Indeed, some of the very books that were published by them were written, not on the battle ground, but actually on the Catskill mountains. Is it possible, then, that you can attach value to such flying observations as these must necessarily be?

7th. In addition to the details cited from Thucydides, Livy, and from the writers of modern times, I might here introduce similar facts recorded of the plague of Florence, which appeared in that city in 1348.*

But to conclude upon this part of the subject, and in the language of Dr. Chisholm himself, "Every physician who has delivered his opinion of the origin of the plague maintains, that a peculiar state of the air is absolutely necessary to establish the powers of contagion, and give circulation to the imported infection."†

Another disease which I have placed in the same class with the plague, and have considered as governed by the same laws of communication, is dysentery. By this disease I mean not that local affection of the bowels which is frequently symptomatic of diarrhœa, and unaccompanied with fever, but that form of it which has been described by Sir John Pringle, Sir Gilbert Blane, and other practical writers, under the title of epidemic dysentery, or the dysentery of camps.

This disease, like the plague, appears also to derive much of its infectious character from the condition of the atmosphere in which it takes place. In pure air, where cleanliness and ventilation are attended to, it rarely extends beyond the indi-

* See Introduction to Boccacio's *Decameron*.

† Essay on the Malignant Pestilential Fever, vol. i. p. 286.

vidual in whom it first originates; but in a vitiated atmosphere, loaded with moisture, marsh effluvia, or the perspirable matter, and other excretions of the human body, especially where many persons are crowded together and in small apartments, dysentery communicates itself to the greater part of those who may be exposed to its influence. Zimmerman remarks, that "in general it appears to him that dysentery became contagious purely through nastiness and the crowding many people together in a small space, but was by no means so of itself."*

And as a further evidence that the disease was derived not from the noxious qualities of the atmosphere alone, but from contagion communicated through that vitiated medium, he also observes of the dysentery which occurred at Dettingen, in 1743, that such of the officers, among whom it was not so general as among the soldiers, as had lain wet at Dettingen, were first attacked by it; the rest received it by contagion: but a regiment that had not lain in the damp, nor been exposed to the rain, remained perfectly free from it, at a small distance from the camp; though, excepting that they were not subject to the contagious effluvia of the rest, "they breathed the same air, ate the same provisions, and drank the same water."† And in the hospital in the village of Feckenheim, about a league from the camp, the dysentery being introduced, "the air became infected to such a degree that not only the rest of the patients, but even the apothecary, nurses, and the other servants, with most of the inhabitants of the village, were infected."‡

Dr. Donald Munro, who, as an army physician, had frequent opportunities of observing the character and progress of dysentery, ascribes the greater violence of this disease to obstructed perspiration, moist and putrid vapours, the putrid steams of dead horses, of the privies, excrements not covered with earth, or to the unwholesome, moist, putrescent vapours of marshy or wet grounds, or pools of stagnated water acted upon by the heat of summer, and of other corrupted animal or vegetable substances, all which served to increase the infection. Hence he observes, that in camps the more hot and rainy the season, the more wet and marshy the ground, and the more the air is

* Zimmerman on Dysentery, p. 20.

† Ibid. p. 26.

‡ Ibid. 139.

replete with putrid vapours, the more frequent and the more fatal is the dysentery.*

The remarks of Sir John Pringle are also in point on this subject. "Some dysenteries," he observes, "appear upon first taking the field, but the cases are never so bad nor nearly so frequent, as towards the end of summer; they then become epidemic and contagious. They have always been numerous and worst after hot and close summers, especially in fixed camps, or when the men lay wet after a march in warm weather."† "In general the contagion does not suddenly spread; for whole towns and camps are never seized at once from the impurities of the atmosphere; but the infection is carried from one to another by the effluvia, or clothes and bedding, &c. as in the plague." "In camps the contagion passes from one who is ill to his companions in the same tent, and from thence, perhaps, to the next." "The foul straw," he adds, "becomes infectious; but the greatest sources of infection are the privies, after they have received the dysenteric excrements of those who first sicken. The hospitals likewise spread it, since those who were admitted with the flux not only gave it to the rest of the patients, but to the nurses and other attendants of the sick."‡ And to show that this disease is not dependent on a general constitution of the atmosphere, but upon that which is impure, and to which the dysenteric taint has been communicated, he observes of the epidemic which raged at Nimeguen, in 1736, "that none of the neighbouring towns suffered, unless by their communication with the place infected."§ Similar facts, illustrative of the rapid extension of this disease, when introduced into ships of war, are recorded by Dr. Blane, in his valuable work on the Diseases of Seamen.

That the contagiousness of typhus fever is also, in a great degree, ascribable to a similar condition of atmosphere as its pabulum, is demonstrated by facts recorded in almost every book of practice, more especially in those relating to the diseases of the army and navy, which have ever been found to be nurseries of this disease. The observations made upon this subject by the Linds, Pringle, Blane, Percival, Smyth, Trotter,

* Diseases of the Army, vol. i. p. 314—316.

† Ibid. p. 254.

‡ Ibid. p. 218, 7th ed.

§ Ibid. p. 252.

Haygarth, Ferriar, Currie, and others, relating to the spread of this disease, when introduced into hospitals and ships of war; its prevalence and diffusion among the poor of London, Edinburgh, Liverpool, and the manufacturing towns of Great Britain; the beneficial effects which have been derived from the establishment of fever wards, and houses of recovery; the advantages which have been experienced from the fumigating or oxygenating processes introduced by Dr. Johnstone of Worcester, Guyton De Morveau, and Carmichael Smyth, in arresting the progress of the typhus fever—all irresistibly lead to the conclusion, that the impurities of the air constitute the fuel of this disease; and, to use the expressive language of Dr. Ferriar of Manchester, in a late communication which I have received from that learned physician, that “dilution with atmospheric air is now ascertained to be the most effectual mean of destroying contagion, and of controlling the ravages of this disease.”*

Were it necessary, I might adduce a volume of additional testimony on this subject. I cannot, however, omit the following pertinent remark of Dr. Haygarth, who, like another Howard, has devoted his life to the investigation of this interesting subject; and to whom Great Britain is indebted for the first establishment of institutions specially devoted to the important purpose of arresting the progress of contagious diseases. In his remarks on the nature of the contagion which produces putrid fevers, he observes: “I soon discovered that their infectious atmosphere was limited to much narrower extent than even the small-pox. So manifestly I observed this to be the case, that in a clean, well-aired room, of a moderate size, the contagious poison is so much diluted with fresh air, that it very rarely produces the distemper, even in nurses exposed to all the putrid miasms of the breath, perspiration, fæces, &c.; whereas, in the close, dirty, and small rooms of the poor, the whole family generally caught the fever. Hence we may conclude, that in well-aired and clean apartments, the air is seldom so fully impregnated with the poison as to acquire an infectious quality.”†

* See American Med. and Phil. Register, vol ii.

† Proceedings of the Board of Health in Manchester.—Letter from Dr. Haygarth to Dr. Percival, p. 8.

The observations of the late Dr. Willan are also in point on this subject. "Formerly," says that accurate observer, "the typhus, with petechiæ, &c. often occurred in our prisons, and proved fatal to those who were under confinement in close cells, or who lodged in crowded apartments. Mr. Box, surgeon of Newgate, informs me that the fever has been rendered less frequent there, and less virulent, by removing the persons first affected into airy rooms, or wards, and by a general attention to ventilation, cleanliness, &c.; so that, at present, petechiæ do not appear in more than one case in thirty."* And of three hundred and seventy-nine patients committed into the London House of Recovery, says Dr. T. Bateman, nine only, or about one in forty-two, were affected with petechiæ.†

* Willan on Cutaneous Diseases, p. 469.

† Ibid.

LECTURE XVI.

CONTAGION, AND ITS LAWS.

THE facts which have been ascertained relative to the communication of yellow fever, furnish no less conclusive evidence that this disease, like those already noticed, is, or is not, generally contagious, depending on the qualities of the air to which it may be communicated. The history of every visitation of the disease in the United States, establishes this truth. It has not only regularly made its first appearance in our sea-port towns, and in those places where the air is most impure; at that period of the year, and in those seasons when such impurities acquire their greatest virulence; in those houses which are most crowded with inhabitants, and where there is the least attention paid to cleanliness; but, wherever the same disease has been thence conveyed to other parts of the same city, or town, or into the country, it either was propagated or extinguished, according to the local circumstances of the place to which it was so conveyed.

1st. Dr. Lining, in his description of the yellow fever which was introduced into the city of Charleston in 1732, 1739, 1745, and in 1748, observes, that, although the infection was spread with great celerity through the town, yet, if any from the country received it in town, and sickened on their return home, the infection spread no further, not even so much as to one in the same house. He remarks, that the disease was generally more fatal to those who lay in small chambers not conveniently situated for the admission of fresh air.*

* Edin. Phys. and Lit. Essay, vol. ii. p. 408, 427.

2d. The yellow fever with which the city of New York was visited in 1791, and which was introduced by a vessel from the West Indies, and rendered memorable by the death of one of our most respected citizens, General Malcolm, who was the first victim to the epidemic of that season, is thus recorded by Dr. Jonas Addoms, in his excellent dissertation on that disease :

“ About the middle of August, 1791, a contagious fever appeared in the city of New York, which first discovered itself near Peck-slip, a part of the city thickly inhabited, its houses generally small, and badly ventilated ; many of the inhabitants were in indigent circumstances, which is a frequent cause of the want of cleanliness. Here it raged a considerable time ; it then began to spread, as some attendants on the sick became infected who lived in other neighbourhoods. By this means it was carried to other families, and most generally could be traced to this source. It likewise proved more particularly fatal near the place where it first appeared, than in any other part. Thus at length it spread through the city, until about the middle of October, when the weather growing a little cooler, the disease greatly abated, and in a short time totally disappeared.”*

Dr. Addoms, the author of that dissertation, since that time resided many years in St. Croix, and being associated with a celebrated physician of that island, the late Dr. Gordon, had ample opportunities of seeing the yellow fever in all its forms. During his last visit to this city, not long before his death, he informed me that the disease which he had seen in New York in 1791, was precisely the same which he afterwards saw in St. Croix, and which frequently prevailed during his residence there, more especially among Europeans newly arrived within the tropics. He also remarked, at the same time, that this disease always acquired new virulence, and was rendered highly contagious, when introduced among soldiers crowded in barracks, or on shipboard.

3d. In the yellow fever of 1793, which was introduced into the city of Philadelphia from the West Indies, it is conceded, on all sides, that the disease made its first appearance in Water street, and that all the cases of this fever were, for two

* Inaugural Dissertation on Yellow Fever, p. 7.

or three weeks, evidently traced to that particular spot. It is also a fact well ascertained, that in the vicinity of the place where the infection was first received, the air was, at the same time, in a very offensive condition, from a quantity of damaged coffee which was exposed upon the dock, and under circumstances favourable to its putrefaction and exhalation. From that place the disease gradually infected a considerable part of the city, the Northern Liberties and district of Southwark, and did not subside until terminated by frost, after having been fatal to nearly five thousand persons.

It is also to be remarked, that its ravages were chiefly confined to the poor, and to those parts of the city where the houses were small, and the least attention given to cleanliness and ventilation. In the language of Mr. Carey, "it was dreadfully destructive among the poor. It is very probable that at least seven-eighths of the number of the dead were of that class; the inhabitants of dirty houses have severely expiated their neglect of cleanliness and decency by the number of them that have fallen sacrifices. Whole families, in such houses, have sunk into one silent, undistinguishing grave. The mortality in confined streets, small alleys, and close houses, debarred the free circulation of air, has exceeded in a great proportion, that in the large streets, and well-aired houses. In some of the alleys a third or fourth of the whole of the inhabitants are no more. The streets in the suburbs that had the benefit of the country air have suffered little. It is to be particularly observed that, in general, the more remote the streets were from Water street, the less of the calamity they experienced."*

"Though the disease," says Dr. William Currie, "was highly contagious, the influence of the contagion was circumscribed to a narrow sphere."†

As a further evidence that it did not depend on a general condition of atmosphere, the same author remarks, "that while this formidable disease was making such ravages in the city, the country, for some miles around, was never more healthy."‡ In another work Dr. Currie has very explicitly

* Carey's Account, 4th edit. p. 61, 62.

† Treatise on the Synochus Icterodes, p. 8.

‡ Ibid. p. 11.

admitted the qualified contagiousness of yellow fever, observing, "that it is only contagious in situations where the air is confined, and the exhalations of the sick are permitted to accumulate, through neglect of frequently changing the bed and body linen of the patient."*

4th. Similar facts are recorded of the visitation which New York experienced of the same disease in 1795. Upon another occasion I shall make public the evidence which is in my possession, indisputably proving the importation of the yellow fever of that season from Port-au-Prince. In that year the disease appeared upon the east side of the city, first affecting some seamen who had received the infection from a brig directly from Port-au-Prince; from thence it spread in the vicinity from Dover street to Peck-slip; but throughout that season it was confined, in a great degree, to that part of the town where the local condition of the atmosphere was peculiarly favourable to its diffusion; for not only an unusual quantity of filth was accumulated in Peck-slip, but at that very time a great number of emigrant poor had arrived from England, Ireland, and Scotland, so that the numerous lodging houses, especially in that neighbourhood, were unusually crowded; add to this, that the weather was uncommonly moist, and thereby particularly calculated to spread the infection. According to the statement made by Dr. Bayley, it was especially fatal to the emigrants of that very summer; for "out of nearly eight hundred persons who died," he observes, "not more than one hundred and fifty were citizens of New York."†

In another part of the same statement he remarks: "So limited was the operation of the contagion, that the number of those taken sick in low situations, compared with those residing in more elevated parts of the city, may be computed as twenty to one."‡

5th. In 1798 New York was again visited with this scourge of our sea-port towns: during the months of August, September, and October, about two thousand persons fell victims to this disease, at the end of which time a keen frost put an

* See *Observ. on the Yellow Fever*, in the *Philad. Med. and Phys. Journal*, vol. ii. part 1.

† See Bayley on the Epidemic of 1796, p. 90.

‡ Ibid. p. 80.—See also *Letters to Dr. Buel* by E. H. Smith.

almost instantaneous termination to its progress. The disease of that season first appeared at the ship-yards, in the neighbourhood of New-slip, and, as in former years, was introduced from the West Indies.* After cutting off several persons in the neighbourhood in which it commenced, the same vessel was removed to the Coffee-House slip, also on the east side of the city; from thence the disease was communicated by those who worked on board to a thickly-settled part of the city, where the houses are small, the streets narrow, and chiefly occupied by the poor; viz. Cliff street, John street, Ann street, Fair street, Eden's alley, and Rider street; at the same time, however, it still continued to extend its ravages in the vicinity of the place to which the poison had been first communicated; and to some other thickly-settled parts of the town, to which it was subsequently conveyed. In a short time afterwards it was introduced into Pearl street, and in that part of it between Burling and Peck slips, where it spread very extensively. In that season a number of circumstances occurred to diffuse the contagion in that part of the city; a great quantity of rain had fallen, so as to overflow the cellars in Pearl street, which were, at the same time, stored with salted provisions; these were soon afterwards spoiled, and loaded the atmosphere with a highly offensive vapour; the disease raging at that time in that neighbourhood, acquired new virulence, and, for the most part, followed the course of the vitiated atmosphere; "beyond the limits of which," says Mr. Webster, "the disease exhibited little infection:" indeed the extension of this disease, as has already been frequently observed, was so circumscribed within the limits of this impure air, that it became very generally believed that, in that season, whatever may have been the case in former years, the disease exclusively arose from those domestic sources, more especially from the putrid provisions. But that the yellow fever of that season did not derive its origin from the spoiled beef is evident, not only from the fact that the disease had already previously appeared in other parts of the town, and even in that very neighbourhood, before those heavy rains had fallen, and their pernicious effects

* See Statement of Facts on this subject by the Rev. Dr. M'Knight, in the Amer. Med. and Phil. Reg. vol. iii.

were perceived; but also that those tainted provisions, unaccompanied with the specific poison of the disease, did not of themselves communicate infection to those who were constantly exposed to their effluvia.

Mr. Edmund Prior, the inspector-general of beef at that time, informed me, that of forty persons whom he had employed in examining the beef, and in removing and emptying such barrels as were found in a putrid state, not one was taken ill of the yellow fever. But Dr. Chisholm and Dr. Stewart have abundantly shown, that decomposed animal or vegetable matters will not, of themselves, produce the pestilence; and that this disease is generated in the human system, and communicated from one person to another, by a peculiar secretion from the morbid body. My object is to show, that when such virus is introduced into a certain state of atmosphere, the disease is readily multiplied and communicated, but that beyond that atmosphere it is rarely infectious.

Although the diseases which have been noticed are rarely communicable in pure air, and are not generally contagious in the country, it is not less true, that in some few instances it appears either that the virus, as secreted from the diseased body, is alone in sufficient quantity, or possesses a sufficient degree of virulence, to reproduce such diseases; or, that by means of the impurities collected about the diseased individual, occasioned by inattention to cleanliness and change of clothing, the retention of his excretions, or the confined air of his apartment, the virus itself becomes multiplied, and thereby the means of communicating the disease from one to another are in some degree increased: for it is a fact not to be questioned, that instances of yellow fever, as well as of the plague, dysentery, and typhus fever, have been occasionally infectious, even in the more pure air of the country, though it must be acknowledged that such cases are of rare occurrence.

It is observed by Dr. Rush, whose records of the several visitations of the yellow fever in the city of Philadelphia will be lasting monuments of the facts which they contain, as well as the impressive and eloquent manner in which they are related, "that out of upwards of one thousand persons who have carried this disease into the country from our cities, there are not more than three or four instances to be met with

of its having been propagated by contagion.”* Such instances, however, have occurred in New Hampshire, as related by Dr. Spalding;† in Connecticut, as stated by Dr. William Moore, of this city;‡ on Staten Island, in 1798, as recorded by Dr. R. C. Moore,§ now the venerable bishop of Virginia; at Huntington, on Long Island, in 1795 and 1798;|| and at Germantown, in the vicinity of Philadelphia, as related by Dr. Wistar.¶ But these very exceptions, if they can with propriety be denominated exceptions, manifestly prove the specific character of those diseases, and that they are propagated by a specific secretion peculiar to each disease, whether it be plague, dysentery, or yellow fever. Indeed, to use the emphatic expression of the Edinburgh Reviewers on this subject, “In the present state of medical knowledge, it would not be at all more absurd to deny the existence of fever altogether, than to maintain that it is not propagated by contagion.”** But, in the language which Dr. Mead has applied to the plague, we may say of all the diseases of this class, “that a corrupted state of the air is, without doubt, necessary to give these contagious atoms their full force.”††

If it were necessary, I might go on to cite every return of the yellow fever with which the United States have been visited, to show that the progress of the pestilential poison has ever been commensurate with the impurities of the atmosphere, and that, when sufficiently diluted with pure air, it ceases to propagate itself.

It is probably owing to this impure condition of the atmosphere that the various fevers, and the greater mortality of diseases in general, are to be ascribed, which physicians have frequently observed to precede the appearance of pestilential disorders, and to announce their approach, and which have led many to conclude that the pestilence itself was thus engendered by local circumstances, and not imported.

* Observations on the Origin of the Yellow Fever of 1799, p. 12.

† Med. Repos. vol. iii. p. 8.

‡ Addoms's Disser. p. 7. Amer. Med. and Phil. Reg. vol. ii. p. 177.

§ Ibid. vol. ii. p. 22.

|| Ibid. vol. iii. p. 191.

¶ Additional Facts and Observations by the College of Physicians of Philadelphia, p. 30.

** Edinburgh Review, vol. i. 246.

†† Mead's Medical Works.

Facts of this nature have served to mislead the editors of the Medical Repository, and many other late writers, who thus confound the exciting and predisposing causes of disease; who do not discriminate between the inflammable materials, and the spark which lights the flame; but have identified the domestic circumstances which have served to diffuse the poison of yellow fever, with the peculiar virus itself, by which that disease has been introduced into the various cities of the United States.

The same local circumstances, I believe, will go far in accounting for the "pestilential state of the air," the "secret constitution of atmosphere," so often recorded by writers on epidemics; at the same time that they teach us, that the diseases now under consideration are only epidemic in as far as the vitiated state of the air is itself epidemic.

I however wish it to be understood, that I do not exclude the influence of bodily predisposition, the passions of the mind, and many other circumstances, in aiding the propagation of pestilential diseases.

Having, as I trust, shown, by the facts that have been adduced, that the plague, dysentery, typhus and yellow fever, constituting the third class of contagious diseases, require an impure state of the air to diffuse and multiply them, the question next presents itself, in what manner does such impure air operate in spreading those diseases? Upon this part of the subject I have the misfortune to differ from Dr. Chisholm, no less than I do as to the necessity of such an atmosphere to propagate the peculiar poison of each of those diseases. Dr. Chisholm observes, that if the proposition had been advanced, "that those diseases, particularly the pestilential yellow fever, are rendered more violent in the action under the circumstances stated of an impure atmosphere, that no possible objection could be made to it, inasmuch as it is supported and proved by all experience;" and he proceeds to express the opinion that such an atmosphere may have an effect "by rendering the system of the healthy person, who receives the poison from the sick, more susceptible at the moment of its introduction, of its peculiar action;" but that this multiplying power does not proceed from any action of the air upon the peculiar virus of those diseases; that "it does not proceed

from the impure atmosphere becoming assimilated to the poison introduced."

That air, deprived of its due proportion of oxygen, and loaded with mephitic materials, especially the confined excretions of the human body, will vitiate the mass of circulating fluids, and impair the functions of the nervous system, cannot be denied; that the febrile diseases with which the system may be affected while in this state, will acquire an extraordinary degree of malignancy, will also be readily conceded; but that such condition, either of the atmosphere or of the human system, increases its susceptibility to be acted upon by the virus of those contagious diseases, composing the third class, does not correspond either with the facts which have fallen under my own observation, or with those I have been enabled to obtain from the writings and observations of others.

The well known facts relative to the communication of "jail fever" to the judges presiding at the Black Assizes, in 1577;* and a similar infection being communicated to the judges on the bench, and other persons present, at the sessions held at the Old Baily, in 1750, while the prisoners themselves remained in health, insensible to infection, furnish incontestible evidence of the effects of habit in diminishing the insensibility to the poison of fever. And with regard to the yellow fever, it assuredly has not been the case in the United States, that those who are most accustomed to the impure air of the place in which the disease prevailed, were more susceptible of the disorder than those who had recently arrived from the pure air of the country, or from the more elevated parts of the town. On the contrary, those who were least accustomed to the impure air of the city, or of the infected spot, were uniformly observed to be most susceptible of the contagion. Those, too, who enjoyed the most vigorous health, and the most robust constitutions, the reverse of that condition of body which would be the effect of residence in impure air, were more readily infected upon coming into the atmosphere impregnated with the contagion, than those who had remained constantly exposed to its influence. Whatever differences of opinion have existed among the physicians of the United States as to

* Bacon's Works, vol. ii. Stow's Chronicle.

the origin of the disease, they all perfectly agreed relative to the facts which I have just stated. Indeed, Dr. Chisholm himself inadvertently admits the same to be true; for he observes, that, in the West Indies, sailors, soldiers, and young men, especially those who had recently arrived from Europe, and are least accustomed to the climate, were more obnoxious to it than others.*

Dr. Gordon, and indeed all the most distinguished practical writers on this subject, concur in the same observation. "New comers," says Dr. Gordon, in the appendix to Dr. Chisholm's late valuable letter to Dr. Haygarth, "were infected with the pestilential fever, while the old seasoned soldiers had only the tropical remittents; and this was universally the case whenever both diseases were at the same time epidemic."† A similar and still more general observation on the predisposition of those who are unaccustomed to impure air, is made by Dr. Blane. "Infection," says he, "like some other poisons, does not so readily affect those who are accustomed to it, and therefore those who are in the habit of being exposed to it frequently escape its bad effects." For the like reason, he adds, "physicians and nurses are less susceptible than others; and strangers, who are accustomed to a pure air; are the most susceptible of any."‡ With these facts and observations before us, we are compelled to conclude, that the impure air necessary to propagate the contagion does not operate in the manner Dr. Chisholm supposes, by "increasing the susceptibility of the system to the action of the poison introduced." On the contrary, I believe that it produces its effects by some chemical combination with the peculiar virus secreted from the diseased body, and that thereby the contagion becomes more or less extensively multiplied, according to the extent and virulence of such vitiated atmosphere.

I shall not attempt to define the precise nature of the chemical union which takes place under such circumstances. But I wish it to be distinctly understood, that in such combination, I do not believe, with those writers who contend that a *tertium quid* is produced; or, as Dr. Adams of London, in his late

* Chisholm's Letter to Haygarth, p. 182, &c.

† Ibid. p. 220.

‡ Diseases of Seamen, p. 223.

publication on epidemics, has reiterated the same idea, "that a new kind of air is generated."* On the contrary, as far as I am enabled to view the subject in connexion with the facts usually observed during the prevalence of the diseases which have been noticed, I am inclined to believe, that in this combination the peculiar virus of those diseases is in no way changed, but multiplied; and that this multiplying power is a process very analogous to that which we observe to take place in the assimilation of the fluids of the human body to the peculiar taint which may be introduced into the system, as for instance, in small-pox and syphilis; or, perhaps, that it more nearly resembles the process of fermentation, as it occurs in inanimate matter. By both these processes such an assimilation takes place in the fluids acted upon, whether of the living body or in dead matter, that they partake of the same properties with the virus or ferment introduced, and are thereby rendered capable of renewing the same process in other bodies under similar circumstances. This process has very properly been denominated by Dr. Walker† the assimilating fermentation,‡ and has been no less successfully employed both by him and by Mr. Cruikshank,§ as well as by Dr. Cullen, to explain the changes which take place in the living system, acted upon by small-pox, and the virus of other contagious diseases, than it has been by Sir J. Pringle,|| Macbride,¶ and Alexander,** to the phenomena of fermentation, as it occurs out of the body. The history of plague, dysentery, and typhus fever, as well as the recent observations in animal chemistry, furnish a variety of facts which may be adduced in illustration of such fermentative process taking place in the atmosphere, and in watery fluids loaded

* Adams on Epidemics, p. 11.

† Walker's Inquiry into the Small-pox.

‡ This assimilating process is, I perceive, adopted by Dr. Good in his late very learned work, (see vol. ii. p. 546-7.) "All," says he, "concur in evincing the existence of morbid and specific poisons in the blood, acting the part of animal ferments, converting the different fluids into their own nature, exciting the commotion of fever, and being eliminated on the surface, as the best and most salutary outlet to which they can be carried by the very fever which they thus excite."

§ Anatomy of the Absorbing Vessels.

|| Diseases of the Army, Appendix.

¶ Experimental Essays.

** Experimental Essays and Experimental Inquiry.

with the excretions of the human body, or the vapours of vegetable and animal substances in a state of putrefaction.

Similar facts, illustrative of the fermentative process contended for, have been observed whenever the yellow fever has prevailed in any of the cities or towns of the United States. I have already stated, that this disease has always prevailed in proportion to the presence of such fermentable materials. It is no less true, that whenever the disease has been introduced, it has spread in the greatest degree in those seasons when the air was unusually moist: this was remarkably the case in New York, in 1795* and 1798,† and in Philadelphia, in 1793 and 1798:‡ and that the yellow fever has prevailed in the United States in those seasons when the heat, combined with moisture, was most favourable to such assimilating or fermentative process, is also proverbially true. It is also to be observed, as universally admitted, that the same disease has uniformly been extinguished by the approach of frost, which destroys such fermentative process.

Another argument in favour of this explanation is derived from the fact, that this disease has, in several instances, been introduced into our cities without extending beyond the individuals who have introduced it; manifestly owing to the active exertions of a vigilant police, at the same time that every attention was paid in preserving cleanliness about the persons of the sick. This was remarkably the case in the year 1804, when the yellow fever was introduced at the Wallabout, on Long Island; and in 1809, when the same disease prevailed at Brooklyn. In each of those years the fever was introduced into this city by persons who had received the infection on Long Island; but, owing to the circumstances just mentioned, it was not communicated to others: while the same disorder, owing to local circumstances, spread in the vicinity of those places on Long Island where it had first appeared.§

During the year 1811, the yellow fever was also introduced into the city of Amboy, New Jersey, from the Havana, but did not spread beyond those persons who were first attacked in

* See Bayley on the Yellow Fever of 1795.

† Hardie on the Yellow Fever of 1798.

‡ See Rush and Currie.

§ American Med. and Phil. Reg. vol. ii. p. 95, &c.

consequence of their immediate exposure to the air of the infected vessel. The local circumstances of Amboy, its elevated situation, its dry and sandy soil, its wide streets and spacious houses, their distance from each other, and the remarkable cleanliness of the town, most satisfactorily account for the sudden extinction of the disease, while the evidence of its importation must be admitted to be conclusive.*

But there is another circumstance which particularly merits attention. In every epidemic visitation of the yellow fever, several days, viz. from eight to twelve, or fourteen, have generally elapsed between the first cases that appeared, and the communication of it to other persons, even in the same neighbourhood: insomuch that not only our citizens, but our physicians themselves, have been led to doubt the existence of the disease, and to stigmatize as alarmists those who first announced the deadly visitor. I can never forget the occasion, in 1795, when that venerable and experienced physician, the late Dr. John Bard, assembled the physicians of this city to announce to them the first cases of this disease which he had observed in the family of his friend, Mr. Jenkins. The physicians met, but declared they had seen no other fevers than what they had been accustomed to observe every year, and even doubted, on that occasion, the correctness of Dr. Bard's observations, relative to the nature and character of the disease to which he called their attention: but that accurate observer had been too familiarly conversant with the yellow fever as it appeared in New York in 1743 and 1762, and too well knew the pathognomonic symptoms of that disease, to confound it with the fevers of our own climate: he, accordingly, in the most emphatic language, replied to their doubts; "Gentlemen, within a fortnight you will all see and acknowledge the West India yellow fever to exist in our city." The event is well known.† The same interval between the first cases of the disease, and its subsequent diffusion in the neighbourhood where it first made its appearance, is noticed by almost every writer who has recorded the yellow fever in the United States.

* See American Med. and Phil. Reg. vol. iii. Also, Edinburgh Med. and Surg. Journal, and the Med. and Phys. Journal of London.

† See Bayley and Hardie on the Epidemic of 1795. See also Currie on the Fever of 1799.

A similar interval has been frequently noticed in the history of the plague. Dr. Russel, in his account of the plague of Marseilles, in 1720, observes, "that from the 12th of June to the 23d there was a deceitful pause, during which the popular apprehensions began to subside. The physicians were reproached with ignorance in having mistaken ordinary fevers for the plague. The disease, however, in this interval, had continued to spread in the Rue de l'Escale, where it made its first appearance."*

It has also been remarked of the plague, as well as of the yellow fever, that the infection spread most rapidly when the atmosphere was not only heated and loaded with moisture, but when it was least agitated by wind or thunder-storms. During those calms, when the air may be said to be relatively at rest, it has been uniformly remarked, that the contagion of the yellow fever has multiplied itself most extensively, as was always very apparent by the greater number that were seized within five or six days after such close weather had been observed, all which circumstances certainly conspire to promote the fermentative process that has been contended for.

This is not all: whenever the yellow fever has been introduced into the cities of the United States, its first extension has always been slow and gradual. Upon several occasions its boundaries have been accurately defined by our board of health. This, as I have stated on a former occasion, was remarkably the case in this city in 1805. The disease, in that year, was confined, for some weeks, to a small portion of the eastern side of the city, and, as stated by the board of health, "not a case occurred in any part of the town, that was not referrible to that as its source."† This fact being ascertained, the board accordingly forbade intercourse with the infected portion of our city, and ordered an abandonment of that part of the town, threatening violent measures if their orders were not immediately complied with. In a short time after, the infection extended a few streets further; the board of health again defined its limits, and again declared that still not a case had occurred that could not be traced to this part of the city as its source.

* History of the Plague.

† Hardie's Account of the Malignant Fever of 1805.

Will not the same assimilating or fermentative process furnish the most satisfactory solution of the fact noticed by Boerhaave, Cullen, Lind, Russel, and many others, that *fomites* are more to be dreaded than the excretions alone proceeding from the diseased body? Not, however, in the manner those authors suppose, that such *fomites* acquire greater virulence; but, that by the same process, the specific poison has been more extensively multiplied by means of the atmosphere and foul excretions which are involved in the clothing worn by the sick; that by the same means the danger of the infection has been increased in the same degree that the poison has been multiplied. As a further evidence, too, that the contagion is multiplied, but not more concentrated, as those writers have imagined, it is a fact established by every writer on those contagious diseases, that the first cases of every epidemic are uniformly the most fatal; but that, as the season advances, the danger of taking the disease is increased, while the disease itself has, perhaps, become even milder than it was in the commencement.

Let me further ask, do not the processes lately introduced for disinfecting the air by means of the fumes of the acetic acid, the oxygenated muriatic acid gas, the nitric and sulphuric acid vapours, operate by making new combinations with some of the ingredients constituting the tainted atmosphere, and thereby decomposing the morbid compound? According to Dr. Crawford, "the fluids which destroy the fœtid odours most speedily are those which are acknowledged to contain the greater portion of oxygen, and it is, therefore, extremely probable that this change depends on the union of the oxygen with animal hepatic gas, or some one of its constituent parts." But the explanation which has been offered by the late Dr. Garnett, of the manner in which the oxygen thus employed combines with the hydrogen gas which holds the morbid secretions in solution, appears to me the most satisfactory explanation that has been given of those phenomena.*

From these facts I have been led to conclude,

* Proceedings of the Board of Health of Manchester, p. 40—42. Robertson's Treatise on Medical Police, vol. ii. p. 127. Robertson's Natural History of the Atmosphere, vol. ii. p. 352.

1st. That an impure atmosphere is indispensably necessary to multiply and extend the specific poison constituting plague, dysentery, typhus, and yellow fever.

2dly. That the impurities of the atmosphere do not produce their effects in the manner suggested by Dr. Chisholm, by increasing the susceptibility of the system to be acted upon by the peculiar virus of those diseases.

3dly. That, instead of predisposing the body to be thus acted upon, the reverse is the fact; that the predisposition of those who are most exposed to such impure air is less, while those who reside in the pure air of the country are most liable to be infected when exposed to the contagion.

4thly. That the impurities of the atmosphere are fermentable materials, to be called into action by the specific ferment of those diseases, aided by heat, moisture, and a calm state of the atmosphere; and that as far as such atmosphere extends, and the circumstances favourable to such fermentative or assimilating process continue, so far those diseases become epidemic, but no farther.

The same idea of an assimilating process appears to be expressed by Lucretius, when, speaking of the contagiousness of the plague, he observes,

"Proinde, ubi se cælum, quod nobis forte venenum,
Conmovet, atque aer inimicus serpere cæpit
Ut nebula ac nubes paullatim repit, et omne,
Qua graditur, conturbat, et immutare coactat.
Fit quoque, ut in nostrum quum venit denique cælum
Conrumpat, reddatque sui simile, atque alienum."

LUCRETIVS, de Nat. Rerum, lib. vi.

Or, as it has been rendered by that learned surgeon and accomplished scholar, John Mason Good, Esq.

"But when the heaven of poisonous power to us,
First moves remote, its hostile effluence creeps
Slow, like a mist or vapour; all around
Transforming as it passes, till at length,
Reach'd our own region, it the total scene
Taints, and assimilates, and loads with death."

If the view which has been taken of this subject be correct, a still more important truth is the result; that, while by a rigid

and well executed system of quarantine laws, we have it in our power to guard against the introduction of the spark that kindles the flame, we are also enabled, by means of domestic cleanliness and ventilation, to extinguish it when introduced. For this purpose our magistrates and guardians of the public health cannot be too attentive in their police regulations to have all noxious materials removed from our streets and our dwellings; and, at the same time that they are ornamenting our cities by the erection of magnificent buildings, and the introduction of other important improvements, they should also avail themselves of every opportunity which may present of widening our streets, and of reserving squares and other pieces of ground to be ever kept vacant, as among the most effectual means of preserving the health of our citizens, and guarding against the propagation of contagious diseases.

———το Πελασγικὸν ἀγρὸν ἀμεινον.

———"Best is Pelasgic empty"

was wisely expressed by the Pythian oracle; thereby denoting that every large and populous city, as well as Athens, should have its pelasgics, or vacant pieces of ground, as so many reservoirs of pure air, for the purpose of counteracting the effects of contagion when introduced.

LECTURE XVII.

LAWS OF CONTAGION.

I BEG leave to offer you a few additional observations on contagion.

1. When the air is once tainted, and the peculiar poison extended and multiplied, such atmosphere retains the power of communicating the disease a long time after the first cases have terminated. In confirmation of this fact it may be observed, that many years since cases of scarlatina occurred in the family of Col. B., six weeks after the first cases of the disease had disappeared, and the chambers had been white-washed and cleansed. Other children of the same family coming into those apartments were seized with the same disease. In like manner, the air of a town or city will continue to communicate the yellow fever, though the infectious parts have been abandoned, and no more sick have remained.

Jackson, in his Account of Morocco, remarks, that "families who had retired to the country to avoid the infection, on returning to town, when all infection had apparently ceased, were generally attacked and died." The same thing took place during the visitations of yellow fever in the city of New York. Too early return, therefore, of the citizens to their homes is to be guarded against.

Hence, therefore, the air becomes the vehicle, though it may not be the primary cause of the poison.

Upon the same principle, too, it is, that *fomites*, i. e. clothing worn by the sick, or other substances of a spongy or porous nature, that have been exposed to the air thus contaminated for a long time, retain the poison with which they become impreg-

nated, and afterwards communicate disease. I have seen the cases of some servants in a Mr. O.'s family attacked with yellow fever, upon receiving the clothing of a relative who had died of that disease in the West Indies—at a time, too, when no yellow fever was prevailing in this city. In like manner, after the death of the late Gardener Baker, (well known in this city as the keeper of the Museum, when it was in the Exchange, formerly in Broad street,) who fell a victim to the yellow fever in Boston; his clothes were sent in a trunk to his wife, resident at Governor's or Long Island. Upon opening the trunk and handling his clothing, his wife contracted the same disease, although in the pure air of the country, and within five days fell a victim to yellow fever, attended with black vomit and all its other characteristic symptoms—at a time, too, when that disease did not exist in this city, or even upon Long Island.

Beds, blankets, wool, cotton, from the spongy nature of those materials, are all ready conductors; and, if in foul condition, readily multiply the specific or peculiar poison of the disease, whether it be yellow fever, typhus, or dysentery. Not that it gives rise to the usual produce of filth or miasma, but the peculiar disease the person labours under.

2. Bilge-water, too, is another vehicle of contagion, and as containing decomposed vegetable, and sometimes animal matter, will often give origin to diseases, as typhus fever and dysentery—analogous to the whale of Forestus, the putrid hides at Nevis, and the putrid unburied bodies left on the field of battle. There was the case of the Mohawk, in which typhus fever was engendered by the accumulated filth of one hundred passengers, and perhaps in part from the offensiveness of the materials floating on the surface of the sea after three days' calm in the heat of August, 1794. The atmosphere of a ship containing much offensive bilge-water also becomes the vehicle of febrile diseases that may be introduced. A ship, from her very construction, is peculiarly fitted to harbour and multiply such poison, and is scarcely ever after to be freed from the poison with which she may have become impregnated. Hence the wisdom of the British Board of Admiralty and the Board of Health in directing the valuable ship, the Hankey—which introduced the yellow fever into Grenada and some of the other West India islands, and into Philadelphia in 1793, from

the coast of Africa—to be burned, which was accordingly done. See also an interesting description of the construction of a ship, as peculiarly calculated to retain the poison of a disease, written and published in the American Medical and Philosophical Register, by the late Jonathan Williams. But bilge-water in itself is not in general the source of fevers in our ports. New York, although long distinguished as a commercial city, would, in that case, never have known exemption from that description of disease. Every vessel that sails would have given origin to such fevers.

The putrid air of Burling-slip proved the vehicle, but was not the cause of the yellow fever, when that part of the town was devastated in 1791, the year that Gen. Malcolm became the first victim, after visiting a ship recently arrived from the West Indies, with a corpse then on board of a person who had died of that disease. Not that decomposed animal and vegetable matter will not engender disease; on the contrary, dysentery was produced among the packers of beef when they had occasion to empty the cellars in Pearl street and at the Fly-market, of the putrid beef, and convey the same into the river. This putrefaction was induced by the heavy fall of rain that had preceded, and had filled the cellars, in 1798. See Edmund Prior's Letter, in the Memoirs of the College of Physicians of Philadelphia. The yellow fever also had prevailed in other parts of the town previous to the fall of rain; but upon this occasion neither the men engaged to remove the putrid beef, nor that tainted portion of the atmosphere, had been exposed to the poison of yellow fever, which was confined to the Coffee-house slip, and to the places of residence of those who imbibed the disease from that particular quarter of the town. See Hardie's Report of the Fever of 1798.

3. Foul air in general, I may say, is the vehicle, but not the cause; i. e. it is the vehicle of any peculiar material of disease that may be introduced into it.

Examples. The foul air arising from the process of filling up the Fly-market slip, and that too in the midst of summer, although it occasioned the inhabitants to close their windows, so offensive were the exhalations, did not beget fever. In like manner, when at another season a similar process was performed in Peck slip, yet no yellow fever was engendered.

More recently similar changes were effected in Broad street; the drains were opened—the filth they contained was removed, and the grounds raised, when many of the inhabitants were compelled, by the constantly offensive state of the air, to abandon their dwellings during that season—yet no yellow fever was produced. In these cases the corporation may be considered as making a series of experiments to ascertain if it was possible to engender such disease—but happily they did not succeed, although the season, as it regards all the requisites of heat and moisture, was calculated to produce the disease in question, if domestic circumstances in this latitude could ever give origin to the evil. Another similar proof of the relative innocence of such filth as a cause of yellow fever, is derived from the fact that in this city, previous to the construction of privies, it was the custom to convey the night soil in tubs, and to deposit the same on the shores at Coenties-slip and at Whitehall, which were then washed with the tides. The place of such deposit thence received the name of Rotten-row, which was proverbially filthy, but proverbially healthy. Some of our then oldest citizens considered it a salutary, almost a refreshing practice, to snuff the breezes passing over those deposits of filth. After the burning of the city, too, in 1775, the cellars of the dwellings that had been consumed were made use of as fit places for deposits of a similar nature, but without producing disease in our city. See my Appendix to Thomas's Practice. In like manner I well remember within the heart of our city, at the foot of Frankfort and of Ferry streets, a marshy piece of ground, thence denominated the Swamp, in which similar deposits took place; but however annoying by their odour to the inhabitants, they produced no disease—no yellow fever.

More recently, tan-yards, morocco manufactories, and slaughter-houses, occupied the same vicinity, and are still at this day existing in some of the thickly settled parts of this city, but which are remarkable for their healthy condition, even in the greatest heat of season. The inference, therefore, inevitably follows, that putrid air is not essential to the production of contagious fevers, though so considered by some. Hence it was that the slaughter-houses were removed from Paris to the Isle des Tygres. See *Gent. Mag.* for 1764. Also, *Quarterly Rev.* Oct. 1814, p. 58. And that it is not necessarily the cause,

though it serves to convey and multiply the poison. This fact was originally remarked by Lucretius of the plague of Athens, that such poison when introduced, creeps slowly, assimilating the air to itself. His line shall be my motto.

“Taints, and assimilates, and loads with death.”

The manner and nature of this ferment we have already endeavoured to explain. This is confirmed by the fact, that at many of those parts of the town, at other seasons, when the air was undisturbed, and less foul, and less offensive, fever has prevailed, but only when manifestly introduced by a diseased individual or some imported fomites, and to which the disease was to be distinctly traced.

It is, too, to be observed, that the yellow fever has only become more prevalent since a better police has been introduced into our city; but it is also to be added, that it has become more frequent since our commerce has become more extended to the West Indies and to the tropics. Let us also recollect that during the embargo, when all intercourse with the tropics was suspended, we enjoyed a perfect exemption from that scourge of our sea-ports, and that, too, throughout all the cities in the union. A general state of health prevailed as long as embargoes and non-intercourse continued.

Again: were it possible that such animal and vegetable decomposition should be the source of the pestilential forms of fever, instead of being confined to our cities, the country too would in like manner be affected. Every hog-pen, every cow or horse-stable, every tan-yard, would be the parents of plague and of yellow fever.

5. Another observation deserving our notice, and which shows the distinction between the operation of ordinary putrid materials on the constitution, and the peculiar poison engendering fever of a pestilential nature, is, that the *materia febricalis*, as remarked by Fordyce and others, to be frequently without smell, manifesting no sensible effluvia; it is known to produce a very peculiar and strong impression on the person attacked, in some cases producing a deliquium—in others, nausea and vomiting;—in some, stupor, mania, and even death itself, have been the effect of the deleterious operation which such poison produces

upon the sensorium. Accordingly, Thucydides, Russel, and others, have related the fatal effects of plague as occasioned by this invasion of the disease; and that in every such endemic visitation persons have fallen down dead on the streets. Similar facts have been recorded of the effects of the poison producing yellow fever in this city, and in Philadelphia in 1793, 1795, 1798, &c. It has happened, too, frequently, that persons seized in this city with yellow fever were instantaneously conscious of receiving the peculiar virus into their constitution. Dr. Richard Bayley, Dr. Malachi Treat, Dr. Ledyard, Dr. Benjamin Dewitt, all health officers, and who fell victims to the disease, were conscious at the instant of the attack, of the reception of the poison during the performance of duty. The two former did not believe, when they entered upon their duties, that the yellow fever was propagated by the medium of contagion. Dr. Richard Bayley stated to his assistant, Dr. Joseph Bayley, while returning from visiting a ship at quarantine, that he never before experienced a similar sensation, and that he was then sensible that he had contracted the disease prevailing on board said ship. He died of black vomit a few days after.

Dr. Treat, in 1795, upon returning from his official visit on board the *Zephyr*, from Port-au-Prince, and which had lost many of her crew with yellow fever, was seized with vomiting while on board, and on his way home stopped at the house of the Rev. Dr. M'Knight, (see M'Knight's letter in the *American Med. and Phil. Reg.*) and afterwards at Mr. Clason's dwelling, and requested some brandy and water to compose his stomach, alleging to them that he was certain, from his extraordinary sensations, such as he never before had experienced, that he had taken the yellow fever from that ship. His anticipations were too true—he died in three or four days from that time, with the characteristic symptoms of that disease.

Mr. Concklin, of Huntingdon, Long Island was also conscious of his attack, went to Long Island and communicated the disease to his family, and to the connexions who attended them. The disease was pronounced yellow fever by Dr. Udall, of that vicinity, who had been familiarly conversant with yellow fever in the West Indies. See his communication to me in the *Medical and Philosophical Register*. We do not yet know the nature of the gas constituting even miasma, (see Sey-

bert,) nor the particular fluid even produced by putrefaction; and still less are we acquainted with the composition of the peculiar conditions of atmosphere making up the various forms of pestilential fluids.

The atmosphere is composed, according to the analysis of the chemist, of seventy-two parts of nitrogen, twenty-seven of oxygen, and one of carbon. From the analysis made of the fluids produced by the putrefaction of animal substances, according to Troostwyck and Dimond, two German chemists, we learn that their ingredients are the same as those composing the common atmosphere, but in different proportions, viz. sixty-three of azote or nitrogen, and thirty-seven of oxygen; and that this additional proportion of oxygen renders such atmosphere more virulent in its effects, and productive of disease, forming the gaseous oxyde of nitrogen. The same view has been adopted by Dr. Mitchill, and constitutes what he denominates septon. He hence was led to recommend the various alkalies as the means of disarming the septous acid of its malignant qualities. The Doctor adduced in its favour the beneficial effects of lime-water, as prescribed with good effects in yellow fever. He also considered the long exemption of Lisbon from that disease, as owing to its houses being constructed of limestone. But Lisbon became at last the seat of that disease. In this, then, the Doctor's hypothesis failed him. But this was not the most unfortunate event that befell the doctrine of septon. Carmichael Smyth, unluckily for the Doctor, but happily for the benefit of mankind, discovered that the great antidote to contagion was the very gas that Dr. Mitchill considered as the parent of contagion—the cause becoming the cure. It was for this discovery that he received the rewards of Parliament in two large sums of ten thousand pounds sterling each; and that, too, notwithstanding the opposition that was made by Dr. Trotter, who, having been an army physician, was also desirous of at least a part of the loaves and fishes given to Carmichael Smyth. The *Medica Nautica* was published with the view to defeat the success of Smyth; and for the purpose of giving all possible force to his opposition, he summoned to his assistance the doctrines and views of Dr. Mitchill, but in vain. The contagious fever of Winchester was arrested in its progress by Smyth, and the reward was accordingly bestowed, notwithstanding the theories

of Drs. Trotter and Mitchill combined. Besides, it is a well established fact, the discoverers of the gaseous oxyd of nitrogen breathed that air without the evils ascribed to it—another truth militating against the doctrine supported by Drs. Trotter and Mitchill.

But although we do not know the constituent qualities of the fluid of the contagion, as unfolded by chemical analysis, we know what it is not, and we know some of its laws. We know that it is not hydrogen gas, as let loose by the solution of the metals in acids (and which Pilatre de Rozier, in his experiments with Mr. Shaldon, of London, could respire without even the noxious effects it usually produces.) It is not hepatic gas, as extricated by acids from *hepar sulphuris*, the sulphuret of potash; nor is it fixed air, carbonic acid gas, as from the vat of the brewer, and from the Grotto del Cani, or from calcareous substances as detached by the various processes of chemistry; and we have seen that it is not nitrogen gas, nor even the nitrous oxide; but it is usually considered as made up of some of these variously combined.

6th. An observation also meriting attention is, that the contagion of any disease is not communicated to all who may be exposed—that all do not contract a contagious disease, even though exposed to it when in its most virulent state. This we see exemplified in small-pox. Some are never known to take it naturally, or even by inoculation, however frequently it may be repeated. So with syphilis—many escape, though frequently exposed to it. When the small-pox prevailed in the ship of war the *Royal George*, as stated by Lind, out of eight hundred and eighty persons who had never had it, nearly one hundred escaped. The disease, too, terminated in the ship before their arrival in port. A case related by Dr. Walsh, is also in point. A person who had been inoculated frequently—who had slept with many ill of small-pox—who had inoculated his own servants on his estate, took it at last himself, when at an advanced period of his life, and died of it. It may be added, that this is generally the case with persons who contract the disease in advanced life, that they sink under it. Yet sometimes, in fevers, seven of nine exposed have been affected by the contagion. Fordyce, p. 120. We know that they are so communicable, depending on predisposition, viz. as season of the year,

habit of body, climate, purity or impurity of the air—but not by the predisposition noticed by Dr. Chisholm. Such is the mysterious nature of the material producing febrile disease, and such is the general manner of its communication. This leads us to inquire into the origin of contagious diseases.

1st. Of some, the history is not known as to their origin; as small-pox, syphilis, &c.

2d. Some are generated in the system, *de novo*—and in this way are frequently engendered, although in their progress they acquire the peculiar circumstances of propagating themselves by contagion. Examples of these are typhus fever and dysentery, the effects of putrid animal and vegetable decomposition, whether in or out of the body, as the whale of Forestus, living on animal diet, fish, &c.

3d. Some proceed from concentrated human effluvia, as jail fever, as at the Oxford assizes. See Camden's *Britannia*. See Sir John Pringle. See Stowe's *Chronicle*.

The secretions of the skin are noxious, as appears by a chemical analysis of their properties, which have been detailed. If they are injurious to the individual when retained, surely the carbonic and azotic materials secreted from the lungs and skin of many are still more offensive and noxious, and thence fever may readily be induced as the consequence; and that, too, where cleanliness may be otherwise observed.

Fordyce relates the case of four persons riding in a coach half a mile with a person from an apartment in which numbers had been confined for several months, yet were kept clean from putrescent matter. The four died of malignant fever. Fordyce, p. 115. Still putrid air is favourable to its diffusion—but we see fevers generated without it, merely by our own effluvia, when concentrated. In our own jail in this city, in the summer of 1811, a number were taken sick with the typhus fever, proceeding from this source. And more recently it has been engendered by a great number being crowded together in the same manner in our penitentiary and alms-house, and rendered not only a malignant disease, but readily communicable to those who visited the establishments.

Similar facts are of frequent occurrence on board of ships crowded with passengers, as the Irish ships coming to this port with the sons of St. Patrick, especially in the hot seasons

of the year, and in warm latitudes. We see typhus fevers in great numbers thus produced, filling our hospitals.

Nor is this disease confined to the human species; it extends to sheep and hogs. The effluvia from sheep are a source of fever, which readily spreads by contagion among healthy flocks. Dr. Bard's flock of sheep was thus materially injured by introducing among them sheep recently arrived from Europe, which had become diseased on the passage by fevers generated on board, the effects of confinement. They had been selected in Europe from healthy flocks, but by confinement on ship-board, even before leaving the harbour, were attacked with fever, not merely an ordinary sheep fever, but a ship fever. With sheep in a peculiar manner such fever is produced, not merely from their fleece and the heat it accumulates, but from the peculiar oily nature of the secretions, the yolk as it is denominated.

Hogs also are liable to contagious fevers, but less frequently than sheep, for the reason just mentioned. Contagious diseases are generally said not to be communicated from one species of animal to another—nor to men on ship-board. Fordyce, p. 113. We well know that the variolous matter is said to be confined to man—but there are exceptions. In Dr. Bard's flock, an eruption like small-pox made its appearance, and which possessed all its properties. The vaccine virus is also a well-known exception, as appearing in the grease of the horse, upon the teats of the cow, and thence fortunately communicated to the human species. Hydrophobia, too, is communicated from the dog, the fox, the cat and the rat, to man. So, in like manner, has the contagion of yellow fever and the plague been communicated to cats, dogs, and other animals. Dr. Rush, although in his last years he had his doubts of the contagious character of yellow fever, published in his account of the endemic in 1793 several cases of the disease affecting other animals as well as man. The influenza, too, he has recorded as affecting various animals besides the human species. Dr. Rush, had he lived, would, I verily believe, have returned to his former faith in the contagiousness of fever, as he had done with regard to religion. At one period, he varied his religious creed several times. He was Quaker, Anabaptist, Presbyterian and Churchman, alleging that change was the

characteristic of the human mind, and that God alone was immutable. So in medicine :—during one of my visits to him in the last years of his life, I submitted to him my views of the qualified contagiousness of yellow fever. When he returned it to me he observed, “Doctor, you and I can now shake hands, and unite nearly in the same doctrine”—or words to that effect.

To return from this digression. In like manner, 4thly, The peculiar poison of yellow fever is generated in the northern man, when transported to the heat of the tropics, especially in Africa, in the West Indies, and South America. It is not necessary to go to Siam, or even to Africa, for this disease, as many writers have done. A peculiar form of fever is so produced by a tropical sun, when acting upon the northern constitution,—not engendered by putrid animal or vegetable matters. Chisholm has abundantly disproved the first of these supposed sources of yellow fever. See his communication. And Dr. Stuart has clearly demonstrated that the most offensive of vegetable matters, accumulated masses of the husks of coffee, will not produce a yellow fever. See his letter to me during his visit to this city. Such atmosphere, loaded with putrid miasms, doubtless prepares the system to become more violently affected by the disease, and to give wings to the contagion, by becoming assimilated to the peculiar poison introduced into it. It is no objection to the contagiousness of those diseases, that they are engendered afresh. Puerperal fever in Aberdeen, Edinburgh, and in the confined dwellings of the poor, assumes this virulent form, and is rendered communicable. Not so in private life, where ventilation and cleanliness exist in the chambers of the sick. Even intermittents become malignant fevers, under particular circumstances. All fevers, says Dr. Fordyce, are infectious, p. 110. Dr. Gregory, in his lectures, when I had the honour of being his pupil, most earnestly inculcated the same doctrine, which is doubtless correct. In the Edinburgh Review you find the same views entertained. In Minorca, says Cleghorn, intermittents assume this character, when of long duration, in a hot climate or a hot season, and in bad air; i. e. the more the system is vitiated, the greater is the tendency to the typhoid form of fever. Fordyce remarks, that fever is never thus

communicated (from person to person,) when consisting of but one paroxysm only; i. e. it requires duration to produce all the necessary changes in the habit, to give to the disease its contagious character. Fevers, by whatever cause they may have been produced, under the circumstances mentioned of duration or atmosphere, may become contagious. But putrid matter is not in all instances essential, though it is favourable to the origin, and especially to the propagation of febrile disease. "Even in the body," says Fordyce, "contagion in fevers is engendered without signs of putrefaction in the blood, in the solids, or in the secretions." Fordyce, p. 117.

Although fever may frequently be attended with signs of such putrefaction, and be thus rendered more malignant, yet frequently without those appearances it becomes capable of reproducing by contagion the same disease. The matter, therefore, constituting contagion is different from the product of a putrefactive process; i. e. it is a peculiar secretion from the diseased body, it is a peculiar compound, not yet developed by the chemist. But although we know not its composition, if we have attained to some of the more important laws which govern its communication, we make some advance that cannot fail to prove interesting to humanity, and especially to this country, in which the high temperature of our summer seasons render them at least the temporary nurseries of pestilence.

I may here remark, that although heat is favourable to the propagation and the continuance of yellow fever in this country, as being similar to that which gave it birth in the tropics, yet in some other diseases it is less favourable to the propagation. The plague is of this description; it is suspended by intense heat, in the same manner as yellow fever is terminated by frost. The contagion even of the small-pox is destroyed by the regular blowing of the hot winds of Patna; so says Dr. Shoolbred, in his observations contained in vol. xiii. p. 224, of the Medical and Ch. Review. The cow-pock poison is also diminished by heat; hence it becomes difficult to communicate the disease in hot weather. This concludes our view of the exciting causes of yellow fever, as well as of fevers in general. In our next, we shall proceed to the investigation of the proximate cause of fever.

LECTURE XVIII.

THE PROXIMATE CAUSE OF FEVER.

WE now come to the consideration of the proximate cause of fever.

What is a proximate cause? According to Aretæus, the proximate cause of a disease was known only to the gods—by less pious inquirers, ingenious speculation has been exercised, and substituted for established and solid principles. Dr. Gregory answers, “*quæ præsens, morbum facit,*” &c. Have we then such a cause apparent in what we have seen of the phenomena of fever? And is it necessary to the cure of fever that we must know its proximate cause?

Pringle, Lind and Cleghorn, you will tell me, have given us no proximate cause of fever; yet their works communicate more facts directing the treatment of fever, and less theory, than almost any other writers in medicine. I grant it; and I acknowledge still more—that their treatment of fever, too, is the best, and the most successful, being the result of their extensive observations and experience. Yet this is no objection to legitimate deductions, or a correct theory. On the contrary, such principles, at the bed-side, are of immense importance. They not only lead us with firmer step, and with more confidence, in the prescription of remedies, but they extend our horizon—they lead to more enlarged views—they give us a wider range in the use of remedies, or the means of carrying those principles into practice, and they enable us to combine our forces to meet the enemy, instead of the feeble skirmishing that results from the want of a well-digested plan of operation.

Were Dr. Cullen's views of the proximate cause correct,

making debility the cause of fever, then tonics, in all their forms and varieties, would constitute the means of cure: so if the doctrine entertained by others, who trace every fever to a putrefaction of the fluids, were true; then the most industrious use should be made of antiseptics, both internally and externally administered.

Again: if we resolve fever into irritation, it leads to the most active employment of all those means which are calculated to subdue and control such inordinate excitement, wherever it may appear, whether in the agitations of the nervous system, or in the disturbance of the blood-vessels, or as it proceeds from the condition of the circulating fluids, or perhaps all combined. It is therefore of infinite importance to obtain those principles of practice to which we are led by our knowledge of the proximate cause of disease; for without those principles as our guide, our practice becomes limited, and, in some respects, empirical. The investigation of the proximate cause of fever has accordingly exercised the talents of the most eminent medical writers, from the earliest records of the art to the present day; and the opinions which this investigation has given rise to, are not only numerous but contradictory; and they are sometimes so entangled and involved with extraneous matter, that it is frequently difficult to discover in what they really consist. It will be a subject at least of some curiosity with most of you, to know what have been the views of our predecessors with regard to the proximate cause of fever. I will endeavour in a few words to bring the most important of them under your view, and as briefly as possible to develop the principle on which they rest. It will at least serve as an outline for those who may be disposed to extend their researches farther on this subject.

1. Hippocrates, as the first known writer on the healing art, is the first who has delivered an opinion respecting the material cause of fever.

The works that bear his name are numerous, but there is reason to believe that they were not all written by him that are ascribed to him. In that case we are not surprised that there should be some variety in the views and modes of expression in different parts of his writings. Hippocrates may be considered as the founder of the doctrine which traces diseases to

the fluids; and febrile diseases he considered as proceeding more especially from the morbid conditions of the bile in particular.

“The greater number of fevers,” says Hippocrates, “proceed from bile.” At this we are not surprised, after the view we have taken of the effect of fever upon the secretions, and especially as it affects the biliary organs. He accordingly makes four species of fever, as depending on the quantity and the quality of the bile; denominating them synochus or continued fever, quotidian, tertian, and quartan. The synochus or continued form of fever he considers as proceeding from the greatest quantity of bile, and in the least mixed state. This form of fever, too, he observes, terminates in the shortest space of time; there being no respite from the excessive heat, the waste of body is proportionally rapid—soon melted down, is the meaning of his expression. Judging from the climate in which he prescribed, and the predominance of bilious discharges, we have great reason to presume that the type of fever to which he refers must be the common bilious malignant fevers of hot climates, not unlike that with which we have been visited.

The quotidian is next in degree to the synochus, and, according to him, proceeds from the next greatest quantity of bile; and inasmuch as it proceeds from bile in smaller quantity than in synochus, and has a remission, so it is of longer duration, and the body is not so soon worn down. So of the tertian form: it proceeds from a still smaller quantity of bile, has a longer remission, and a longer duration.

The quartan follows a similar rule, and is the most tedious; for he observes, there is less bile to keep up the heat, and therefore it has the longest remissions. But this is not all: in the quartan, he considers the bile as not only less in quantity, but changed in its quality; for in this case he remarks, that the form of fever is owing to black bile, which is the most tenacious and adhesive of any of the humours “within the circumference of the body,” and is not easily disengaged. Hence he infers the longer duration of a quartan fever. This operation of fever, according to its character, whether continued or intermitting, upon the different secretions, is to be looked for. When

symptoms, therefore, are mistaken for causes, we are not surprised at the distinctions made by Hippocrates. This is the fullest and most accurate view of the theory of fever to be found in the writings of Hippocrates.

In another part of his works he introduces secondary causes or qualities, to be conjoined with the bile, such as the bitter, the acrid, the salt, and other qualities. In like manner he notices the excessive flow of bile to the liver and to the head, as additional sources of disease; but bile constitutes the essence of fever, although it may be modified by the circumstances which have been mentioned; and to those he adds cold, as also having some agency in the production of fever.

2. Erasistratus considers fever to consist in a transfusion of red blood into the arteries or air-vessels, in consequence of repletion. The circulation of the blood, it is to be recollected, was not understood at that time—the arteries being supposed, in a state of health, to contain nothing but air, seeing that they are empty when they fall under the examination of the anatomist. Erasistratus supposed the blood to be all naturally lodged in the veins, and that the cause of inflammation, and many other diseases, depended upon the blood getting from the veins into the arteries.

3. Asclepiades was a professed medical innovator. He supposed health to depend upon the just proportion between the pores of the body and the small particles they are intended to receive or convey; and that when these pores are obstructed, and the corpuscles cannot pass through them, disease is produced. The dryness of skin, and other evidences of obstruction, very naturally favoured this view. Proceeding upon this principle he accordingly recommended his patients, ill of a fever, to ride on horseback, for the purpose of removing the obstruction which he supposed to constitute the cause of the disease. He is said, too, to have been the first who prescribed wine for his patients, and to have indulged them in all their inclinations. From all these circumstances, these novelties of practice, and his opposition to the reigning doctrines of Hippocrates, he acquired unprecedented reputation. With these views of disease he thought it necessary, among other things, to new model the theory of fever. He accordingly defines it

to consist in excess of heat, and increased force in the pulses of the artery. That the quotidian, and other forms of fever, are modified by various corpuscles or atoms obstructing the pores of the body; and according to the size of these corpuscles, and the size of the pores they obstruct, disease was produced. In other words, according to the obstruction of the surface, or the dryness of the skin, was the degree and character of the fever that ensued,—a doctrine in a great degree true, though strangely expressed. Here is, in other words, the doctrine of spasm.

4. Themison, the founder of the Methodic sect, and a pupil of Asclepiades, also gave origin to some new opinions; or rather, so modified and extended those of his master, as to give them a new shape, insomuch that he is regarded as the author of that doctrine which refers fever to a constriction or spasm of the smaller extreme vessels, so much afterwards insisted upon by Hoffman and by Cullen; for Hoffman's doctrine is expressly that of capillary constriction, followed by a corresponding relaxation, and a third, or mixed state:—in other words, Brunonianism—and which, as you perceive, is the opposite of the humoral pathology. Themison, as you may suppose, with these Brunonian notions of spasm and relaxation, must have been an unsuccessful practitioner. He was so much so, that Juvenal says of him,

“Quot Themison ægros autumnno occiderit uno?”

But we could scarcely anticipate any other result from a practice founded upon such erroneous and narrow notions of pathology. Not that stricture or spasm does not exist, but that an exclusive view to that, as the source of disease, must be so limited that it supplies us with few or no principles of action.

5. Athenæus, who was the head of another sect, the Pneumatics, (so called from their admission of a fifth element or spirit governing the system—not content with the four elements of the Greek philosophers,) according to the testimony of Galen, appears to have ascribed the cause of every form of fever to a “putrescency in the mass of the humours.” This doctrine was afterwards revived in the morbidic or peccant matter which Sydenham considered as present, and to consti-

tute every form of fever; and that the excitement of the system was no other than an effort of nature to destroy it, by conveying the poison producing it out of the body. This may be considered, in some degree, a revival or modification of the doctrine of Hippocrates.

6. Galen, who is the most voluminous writer, and the most fertile in imagination, of all the ancients, has discussed this subject at great length. Although his views are often entangled and obscure, his opinion is still prominent on this subject. Fever, according to Galen, is present when heat in preternatural quantity is communicated to the heart; i. e. that the existence of preternatural heat does not constitute fever, unless it be communicated to the heart. He moreover adds, that the generic differences in the heat, and which are three in kind, take their character from the difference of the matter on which the febrile heat acts, and which manifests its effects primarily on the body of the heart itself, on its juices, or on its moving power. But Galen considered this heat, and the fever proceeding from it, to have some variety in its origin. In some cases he supposed it to originate in motion; in others, from putrefaction; and by communication of foreign or external heat, in a retention of the heat that is ordinarily extricated from the body, or from the application of actually hot substances. Of continued fever, he considered the cause to be, as it were, immured, and contained within the veins. He furthermore considers the quotidian form of fever to have its origin in putrescent phlegm; i. e. that, in other words, adapted to the present state of medicine, in that form of fever which most nearly approaches to the continued form, the circulating fluids of the system are most affected, and are most apt to assume a malignant or putrescent character. So far, then, you see this idea is of very ancient date.

The other forms of intermittent fever, viz. the tertian and the quartan, Galen referred, as Hippocrates has done before him, to the vitiated condition of the bile. The tertian he believed to be produced by a yellow bile, and the quartan by a black bile. In other words, as this latter type of fever recurs so seldom, (every fourth day,) it has less effect on the biliary organs; hence the bile is of a darkish colour; i. e. fresh bile is not secreted, as in the quotidian, or in fevers of a continued type.

The Arabian physicians did little more than transcribe the opinions of their predecessors. Upon this subject, as in most other branches of medical science, they are mere copyists. Avicenna, who is the best known and the most distinguished, and who has treated medical subjects more in detail than any other of the Arabian physicians, defines fever to consist in preternatural or adventitious heat excited in the heart, and thence communicated to the rest of the body by means of the spirit and blood contained in the arteries and veins; in other words, a preternatural degree of heat extended throughout the system. Such are the principal opinions, on the cause of fever, that are to be met with in the writings of the ancient physicians. Some, you perceive, are altogether ideal; while the greater number of them consist in the appearances or symptoms which fever exhibits, as the effect of diseased action. The increased secretion of bile, its various qualities and appearances, the increased heat of the body, the putrescency of the system, the constriction, the obstruction of the surface, are all to be considered as symptoms or effects, and not the proximate cause of fever.

8. Paracelsus and his followers exerted themselves in opposition to the Galenical and other doctrines of the ancients, relating to the nature and cure of fever. But the greater number of the attempts are so ridiculous and absurd as scarcely to deserve the slightest notice in this place.

The introduction of chemical reasonings, in the imperfect state of chemical science at that time, constituted indeed the acme of medical romance, for no whim was too extravagant to be employed in the explanation either of the operations of life and health, or of the phenomena of disease. Although flashes of light were occasionally produced, as the result of these labours, they were but of momentary duration, neither permanently enlightening medicine, nor contributing to the purposes of general science.*

* Paracelsus supposed the body to be a composition of salt, sulphur, and mercury, and that diseases proceeded from changes wrought in these ingredients. And, after Paracelsus, chemistry was employed to explain most of the phenomena of the human body, and the nature of diseases. The solution of the food in the stomach was ascribed to an acid. Muscular motion was accounted for by the effervescence of an acid and an alkali in the rhomboidal receptacles, which the anatomist supposed to exist in the muscular fibre. The heat of the body

Next succeeded the incorporation of the mechanical and chemical doctrines; but this combination led to no satisfactory solution of the origin and causes of fever.

9. The imaginary lentor and viscosity of the blood with which it was supposed the smaller vessels are crowded, and which, by the resistance to the circulation that they thus created, gave rise to fever, arose from this union of the mechanical and chemical doctrines, and which afterwards constituted the celebrated system of Boerhaave, and the theory of Stahl too in part. It was assumed without any evidence of its existence, with the exception of the dense, inflammatory crust that appears upon blood drawn in fevers, and which has ever been matter of triumph to the believers in this doctrine—found too, in all fevers—on this account, favourable to their views on this subject.

10. The next view of the subject that offers any thing original or deserving notice, is found in the writings of Van Helmont—a man of an ardent and enthusiastic make of mind—distinguished for his genius and his penetration, and who held high rank as a physician. “Febrile heat,” according to Van Helmont, “is the product of the effort of the irritated archæus, (another term denoting the sentient principle or sensorial power,) and the radix of fever is actual peccant matter.” So that fever and febrile heat result from Archæus himself, inflamed by the strenuous effort which he makes to expel something that

they explained by the mixture of the acid of the chyle with an oil or balsam they supposed it to meet with in the blood, analogous to the heat and inflammation excited by mixing acids with essential or distilled oils out of the body. Fevers and other diseases were ascribed to the same or similar agents. The cold fit of an intermittent fever was accounted for by the mixture of nitre or sea salt with the blood, because those substances generate cold by mixture with water out of the body. The epidemic fever at Leyden, in 1669, which proved fatal to more than two-thirds of the inhabitants of that city, Sylvius de la Boe, then professor at Leyden, ascribed to an acid, and attempted to cure by alkalies and absorbents. The great fatality of that disease is ascribed, at this day, in some degree to the injudicious and inert practice which the chemical notions of Sylvius gave rise to. We, too, have had our Sylvius’s (de la Boe.) In this city, in 1798, the same doctrine was revived and published by our learned Professor of Natural History, Dr. Mitchill, who considered the yellow fever of that season to be occasioned by an acid, and accordingly recommended alkalies and absorbents as its means of cure. See his Tract on the Nitrous Oxyd of Azote. Also Med. Repository.

is offensive. This, therefore, may be considered as another expression of the *vis medicatrix naturæ* of Campanella, Sydenham, and others, and even of the *autocrateia* of the celebrated Stahl, who maintains "that all fevers may be regarded as efforts or designs of the vital motions secreting and excreting, instituted, directed, and carried into effect by nature herself, for the preservation of the individual."

There are other opinions to be found in the writings of the eighteenth century, but

11. That of Hoffman, the celebrated professor at Halle, in Saxony, is the most important. Hoffman was a man of great learning—of much experience and observation—of comprehensive genius, and of great apparent candour. "The fundamental cause of fever," according to Hoffman, "is a spasmodic affection of the whole nervous and fibrous system, which proceeds principally from the spinal marrow, and extends in succession from the exterior to the interior parts." This, you will perceive, however, is but a revival of the atomic doctrine of Asclepiades, or of his pupil, Themison, on the spasmodic constriction of the capillary vessels of the skin. The very same doctrine was afterwards adopted by

12. Dr. Cullen, but who proceeded a step higher than his predecessor Hoffman had done, by prefixing a link that he supposed was wanting to establish a regular series of cause and effect, Dr. Cullen believing that Hoffman had only noticed the effect, and had overlooked the cause. This Dr. Cullen believed he supplied by premising certain sedative powers, which operated by producing debility; and that this debility begot the spasm; and that this spasm begot the fever. It reminds me very much of the house that Jack built; so I believe, will the history of Dr. Cullen's fabric remain as a tale to be recited more for the gratification of curiosity, than to serve any really useful purpose in the practice of medicine. Like the supposed morbid matter of Athenæus, and afterwards of Sydenham—like the viscosity and lentor of Boerhaave, and the obstructions of other authors, so of the debility of Dr. Cullen—they are all to be considered rather as the effects than the causes of fever. Morbid matter, doubtless, as you have seen in our enumeration of the remote causes of fever, is occasionally, nay, frequently, an exciting cause of fever; and in the advanced stage,

or typhoid state of the system, is unquestionably a part of the proximate cause of fever, as far as such vitiation of the body as we have seen, can become the cause of the secondary fever which we have noticed. But it is not the proximate cause of all fevers, nor present in every case of fever. When a *materia febricalis*, that gives origin to fevers, as contagion, is present in the system, it is a remote cause, but does not constitute the proximate cause, as it was considered by Sydenham. It was upon this belief that the supposed ebullitions and fermentations which constitute the doctrines of Sydenham, were conceived necessary to throw off such morbid matter—analogous to the eruptions we see take place in small-pox and measles, and to the petechiæ, the carbuncles, and biles of plague; and which, in many instances, are critical eruptions in those diseases. In like manner, the eruptions on the skin, and those which appear about the mouth, are also apparently favourable to the same idea; but they very readily admit of a different solution. These eruptions serve to convert a general into a local disease, and in this way are so salutary; for the same thing is the consequence of blisters and other local stimulants, the effect of art. The evacuations by stool, by urine, by sweat, in like manner prove critical; but they may be useful, and equally so, in removing fever, without carrying out morbid matter. Such matter, however, I have said is frequently an exciting cause of fever; but that in typhus fever it constitutes even a part of the proximate cause. In these cases, then, the doctrine of Sydenham is, to a certain degree, applicable; and is more generally true in fevers than is usually admitted, except that it can hold no place but in the typhoid state of the body, where, by the causes enumerated, the mass of fluids partakes of the diseased action. But with regard to the supposed sedative powers—the debility of the consequent spasm of Dr. Cullen's system, which has been so generally received, it must be acknowledged that debility sometimes precedes fever; but in that case it is only a predisposing cause, by increasing the susceptibility to the action of the exciting causes. Hence, too, we see the typhoid state of fever afterwards induced by the same predisposition; but we see no evidence of debility invariably preceding fever, though accidentally so, as after a debauch or intemperance; but we see irritation, restlessness, and other

symptoms of great disturbance in the system, constituting the first stage, but which are not to be considered as debility, though debility may follow. Again: we see diseases of the greatest debility, as dropsy, paralysis, atrophy, and no fever the effect. We all see great debility in the last stage of fever, and still greater than under any other circumstances after the fever has terminated; yet no relapse, as after long, tedious typhus: whereas, at that time, if debility was the proximate cause, the fever should return with ten-fold violence. My conclusion from these facts is, that debility has nothing to do with fever; that is, not essentially so. Nor are the remote causes necessarily debilitating or sedative in their first application; they are only so in their ultimate consequences; they do not operate in time to produce the debility Dr. Cullen talks of in the first stage. They come too late. Besides, on the contrary, the remote causes are, for the most part, not debilitants, but excitants, giving even temporary strength instead of debility—as exercise, heat, cold, miasma, contagion, spirituous liquors. These are all for the most part exciting causes. His doctrine therefore of debility, as a cause of fever, is purely hypothetical. So also, says his editor and friend Dr. Rotheram, but without giving us a better. Still, as I have said before, error must be first investigated before we can arrive at truth. Let us then agree almost to banish the term debility; it invests the subject with a cloud that totally obscures the truth. This is not all, it misleads the practitioner, insomuch that Armstrong very properly denominates it “the fatal doctrine of debility.” He goes on to remark, “that the speculations of Cullen and other men of genius, which have so long obscured our pathological views, are at length passing away, like clouds before the spreading light of more favoured times; and we may reasonably hope will soon entirely disappear from the horizon of the medical world.” p. 132. “Debility has been pitched upon as the cause of this, and of other dropsies—the bugbear debility—the Circe of fevers, which has been more hurtful to suffering humanity than earthquakes to the physical world—a name, and that name all a lie, has too often been the innocent cause of conducting numbers to the tomb.” Dawson’s *Nosology*, p. 132.

From the view we have taken of the symptoms of fever throughout its progress, from its invasion to its termination—from the nature of the remote causes, including both the pre-

disposing and exciting causes, and the operation of those causes upon the system, I am led to the following conclusions relative to the proximate cause of fever. That it appears to me to resolve itself into IRRITATION, which manifests itself *first* in the brain and nervous system. This is an essential ingredient in the construction of fever.

2. Showing itself in the muscular or moving fibre. This again appears (1.) in the larger muscles, showing itself in the heart and larger vessels: showing itself, 2dly, in the smaller arteries, in the exhalent and secreting vessels, in the absorbent system: and 3dly, as a consequence of such irritation, producing a vitiated or diseased condition of the circulating, secreted, and excreted fluids of the system. In other words, irritation of the nervous and moving fibre—not of the nervous fibre exclusively, (for in that case the disease would be one of those denominated nervous, belonging to the class neuroses)—but including the muscular as well as the nervous fibre. This is the only legitimate conclusion that the phenomena we have seen will justify; and the only deduction which the nature or the operation of the remote causes will sustain. Such I consider to be the deduction which flows from the foregoing facts. This view of it will be found, I trust, important, as leading to correct principles in practice. The indications which are deduced from the proximate cause of fever, corresponding with this view, are,

1st. To counteract the irritation which more especially appears in the nervous system upon the invasion of fever.

2d. To counteract the excitement of the nervous and muscular fibre, as it subsequently manifests itself in the vascular system.

3d. To remove the vitiated state of the fluids which exists in the last stage of fever, or as it appears rather in the secondary form of fever, denominated typhus, or typhoid. This state of the fluids keeping up this stage of fever, (the fever ceasing upon its disappearance,) is properly, in such cases, to be considered as constituting a part of the proximate cause of fever, inasmuch as this state of the system is the cause of a renewed excitement both in the nervous system and in the blood-vessels. The indication to which it gives rise might perhaps have been included in the first two, as it might be embraced among the

means of removing the irritation of the blood-vessels and nervous system. But as this stage of fever exhibits a totally new train of phenomena, and calls for special treatment, calculated to counteract the diseased condition of the fluids, as well as to act upon the solids, I have concluded to make it a distinct indication. This arrangement, too, is better suited to the bed-side; for the physician, when called to the sick room to see a patient ill of fever, has, in this case, three primary and distinct questions to ask himself.

1st. Is this the invasion of fever? My prescription is accordingly manifest.

2dly. Is it the more advanced state of intermittent, or is that excitement ended? And,

3dly. What is the state of the system in other respects? Is it pure debility that remains? or has it ended in a diseased state of the fluids in general; and is such diseased state the result either, 1st. Of simply long continued action? as we see sometimes to occur in inflammatory diseases when protracted, as in peripneumony. 2dly. An original febrile taint in the habit? 3dly. Of a vitiated atmosphere? 4thly. Of the heat of climate or of season? or, 5thly. Of a habit vitiated by bad diet, intemperance, hardship, or long-continued previous diseases of another character? This arrangement, in my opinion, dissects and simplifies that complex subject, fever, and places in a conspicuous light the proximate cause, to the removal of which the physician is to direct all his attention and skill.

If I have erred in any of my premises, or in the conclusions to which I have been led, I am not conscious of such error; but shall be greatly obliged by any corrections or objections to the doctrine I have advanced, that any of the ingenious youth whom I now address may suggest. I invite the most free discussion on this interesting subject. It will be instructive to you, and gratifying to me; and I assure you, it will be no less gratifying to me, at all times, to correct error than to establish truth.

LECTURE XIX.

THE GENERAL TREATMENT OF FEVER.—TREATMENT OF THE FIRST STAGE.

THE treatment of fever now falls under our consideration; and, as in describing the phenomena of fever we divided it into its different stages, we shall observe the same order in speaking of its treatment, pointing out, as far as may be practicable, the remedies proper to be employed in the different stages of fever. At this time I propose, therefore, to point out the general indications of cure, the general means of fulfilling those indications, and the principles upon which those means are to be employed.

In the treatment of the first stage, constituting the invasion of fever, the first indication, as we have remarked, agreeably to our view of the proximate cause, is to counteract the irritation, which appears more especially in the nervous system. Dr. Cullen's indication, agreeably to his view of the proximate cause of fever, ought to be to counteract his supposed debility; and accordingly, bark and wine, with other tonics and stimuli, would be the best remedies; but neither his doctrine, nor the treatment it leads to, I trust, will be contended for. The irritation we have noticed as existing in the first stage, or rather as constituting the first stage, shows itself in various ways. The symptoms which usher in the first stage of fever may be divided into three classes.

The first class we may denominate the ordinary attack of fever, exhibiting itself perhaps by a slight chill and some sense of coldness, but without much pain or any other symptoms, local or general.

In the second class, we find the patient attacked with severe pain, showing itself in the head, back, or limbs, or in all at the same time, with great general soreness and stricture of the surface—a distressing sense of coldness amounting to rigors or perhaps convulsions. These rigors are sometimes fatal, especially to aged persons; but Dr. Cullen remarks, that rigors taking place, the patient is not carried off by that paroxysm. This is not always so. I recollect the case of a gentleman who was thus attacked with rigors upon the invasion of a paroxysm followed by stupor, and which proved fatal to him during that very paroxysm—the irritation was such that they ended in an apoplexy; such was the crowded state of the vessels of the brain. He was subject to intermittents, and they usually affected his head. He had been exposed to the cause of it; it occurred during the season of its prevalence, and from the rigors and general symptoms which ushered it in, the character of the disease was not to be doubted. This event too, I believe, is of much more frequent occurrence than is usually supposed; it might be called the apoplectic state of intermittents.

The third class of symptoms we find still more formidable and alarming, viz. delirium or mania; for all fevers, as we have seen is the case with yellow fever and the plague, are not ushered in by the ordinary chill that usually announces the paroxysm of an intermittent.

In the ordinary attack of fever, the heat generating power of the system is sufficient to counteract the temporary effects of the irritation produced upon the extreme vessels, for the tone of the system is not impaired, nor are any of the vital organs particularly oppressed. In that case, the constitution being good, and the body not more than ordinarily cold, the common practice is generally sufficient, viz. to place the patient comfortably warm in bed, and to administer to him some warm tepid drinks, as various teas or toast water.* Weak mint or

*Let me here remark, once for all, that the proper mode of making toast or bread water, is by infusing the slice of bread, when well browned, in boiling water, but not in cold water, as it usually is done; for the object is to give the drink moderately warm, and to render it grateful to the nauseated stomach; to do so, this is the only proper mode of preparing this drink, and thus prepared, it is one of the most palatable and grateful drinks to patients in general that can be directed in an irritable stomach, at the same time that it is readily obtained.

catmint tea, when they can easily be procured, are preferable drinks when the stomach is disturbed during the invasion of fever. They should, however, be taken of moderate strength, as they may otherwise, by the essential oil they contain, increase the excitement of the system; the quantity too should be regulated by moderation, for we may excite the system by the quantity as well as the quality of the drinks we employ. I frequently also direct the patient previous to his getting into bed, if his extremities be cool, to bathe the feet in tepid water. I then give him a moderate sudorific anodyne, composed of ℥ss. of the spiritus mindereri, with from fifteen to twenty-five drops of laudanum. If the stomach is irritable, administer the dose in mint water.

It is important, however, to remember that the hot stage of fever is very soon to succeed. Keep this always in view in all your prescriptions. On this account, too, observe the temperature of the water in which the patient immerses his feet, of the drinks he employs, and the temperature of the air of the room. With the same view the quantity of his bed clothing should also be regulated by the physician, and all stimuli, such as light, noise, company, business, should be withdrawn or guarded against at this time, in order to prevent or moderate the excitement which is soon to succeed.

But one of the most important and efficacious class of remedies which can be administered at the invasion of fever, (especially the remittent and continued forms of fever,) when the situation of the patient is such as to call for or to justify their use, is *emetics*. Armstrong, a late writer, p. 99, observes that "in the beginning of almost all febrile complaints, emetics will generally be found very beneficial, though much neglected now-a-days by many practitioners." The emetic having operated, I usually direct some Indian gruel, either sweetened with brown sugar, or seasoned with a small quantity of common salt, to be taken afterwards, with the view to obtain some effect from it upon the bowels; in some instances, an hour or two after the emetic has ceased to operate, I add the sulphate of magnesia, or the sulphate of soda, or Rochelle salts to the gruel, or solicit an evacuation from the bowels by an enema, or a dose of Seidlitz powder.

In the first stage, where it occurs under ordinary circum-

stances without those peculiar distressing impressions upon the nervous system; without the inordinate fulness of the blood-vessels producing delirium, stupor, or mania; where the degree of cold is not excessive; where the patient is neither too plethoric nor of too feeble a habit, nor too advanced in life, when the circulation of the brain is less active, and the vessels of the brain are perhaps loaded by the venous plethora; when these circumstances do not forbid their use, emetics, and these given so as to produce full vomiting, may be directed with the best effects. In some instances, too, the breath of the patient is offensive, the tongue is foul and loaded with sordes; he complains of a disagreeable taste in his mouth; in such cases, whether in the adult or child, they are peculiarly proper, especially if the fever may have habitually returned for several days, or there is reason to suspect some additional source of irritation about the stomach or biliary organs, in such instances they cannot be too promptly administered. But not so in stupor or feeble old age, nor in yellow fever, are they to be administered.

What are the effects of emetics, that they are so generally serviceable in fever?

In the first place, they empty the stomach of its contents; not only of indigestible food, but oftentimes of an inordinate quantity of mucus and other materials which may be accumulated in that organ. They promote the secretions of the stomach, and of the adjacent viscera, particularly the liver. They increase the serous discharge of the intestines, and by the relaxing and antispasmodic effects on the whole system, they restore the perspiration, and unlock most of the secretions and excretions of the body. The emetic I prefer in such cases, and with the view to these general febrifuge effects, is composed of ipecac. and antim. as follows: Ipecac. x. gr. to xv. gr., combined with tart. antimony, ij. gr., directing the patient to take little or no drink until it has operated; to be repeated, if necessary, in half an hour, or an hour if it has begun to operate.

For the removal of the second mode of attack, where the patient suffers much pain, a great sense of soreness, or is affected by rigors or convulsions, such remedies are indicated as will most immediately diminish irritation, and particularly such remedies as are best calculated to allay spasm. Opiates, the

warm bath, and tepid drinks, must be had recourse to, and are among the best remedies we can employ for this purpose. Opiates are useful by diminishing sense and motion.

To children I administer ten drops of laudanum every half hour, in conjunction with the tepid bath. In the adult, thirty drops with ʒss. of the sp. mind. may be repeated every half hour, until the nervous system be composed. If the stomach be much disturbed, warm mint water will be the best vehicle for the laudanum. A general warm bath, as soon as it can be procured, ought also in such cases to be employed. In the mean time, however, the limbs may be wrapped up in fomentations composed of vinegar and water, one-third or one-fourth vinegar, and two or three parts water, but not spirituous fomentations; as before, paying attention to the temperature at which they are applied, lest more mischief than good arise from the manner of their application. It is no less important too, in applying them, as far as possible to prevent the clothes of the patient, and the bed and bedding, from becoming wet with the application made use of, as the patient afterwards is rendered liable to a chill from the cold and moisture surrounding him. For this purpose, then, be careful to introduce one fold of the blanket between the legs of the patient and the bed he lies on. Let his limbs then be surrounded by the wet flannels with which the fomentation is applied, and another fold of the blanket that is beneath him turned up, so as also to protect the clothing that is above him from becoming wet and uncomfortable. Another ready and common mode of applying steam or vapour to the body, and one to which the elder Dr. Bard was attached, is by means of bricks heated to a proper temperature. These should be surrounded first by a flannel cloth wet with a mixture of vinegar and water; and in order to prevent the bed from being made wet and uncomfortable, this should be again surrounded with another piece of dry flannel. Two of these bricks thus prepared, and laid to the extremities, or at the sides of the patient, will be found useful both in restoring warmth, and inducing that greatest febrifuge of all, perspiration. And we may observe, that the temperature of the body is much more reduced by perspiration than augmented by the heat that is thus applied in conjunction with moisture or steam. So, in like manner, the

effects of the warm bath in producing a large discharge from the surface, more than counteracts all the heat that has been applied in the bath. But as I have before remarked, you cannot, as a general rule, be too particular in your directions relative to the temperature of all the internal or external applications that may be necessary in the treatment of fever at this stage.

But again: in old men much affected by cold and rigor, their caloric carried off, the patients feeble and not in condition readily to restore the lost heat, and the heat perhaps abstracted by long previous exposure to cold; in that case stimuli may be administered, and are indicated. But even then they should be directed with some caution. *Respice finem* should still be our motto. Cordials and aromatics are improper in most cases of the invasion of fever; but in those which I have just mentioned, in which the system is feeble, the action in the extreme vessels can only be restored by stimuli, administered both internally and externally. Warm and stimulating drinks, such as gin or brandy toddy, spiced wine, or wine whey, should now be freely administered, until the temperature of the patient be restored. With the same view, other stimulants may be prescribed; as a tea-spoonful of compound spirits of lavender, frequently repeated, or twenty or thirty drops of the vinous spirit of ammonia, or of the aq. ammoniæ.

External applications should also be directed, as a hot bath, made still more exciting by the addition of rum, or the aq. ammon. occasionally introduced while the patient is immersed in the water. Stimulant spirituous fomentations—stimulant cataplasms, prepared by dipping a slice of toasted bread in hot vinegar, and covering the same with mustard, may be applied to the soles of the feet, or other sensible parts of the body. The room too should be rendered warm, the patient covered with rather more than the ordinary quantity of clothing, with the view to accumulate heat about his person. But remember, all these stimuli are again gradually to be withdrawn, in proportion as the excitement of the system becomes restored, or may be increased; otherwise these very means of restoring the heat and circulation will be the means of exciting a high and dangerous degree of febrile action.

But when the third mode of the invasion of fever comes on

with delirium, stupor, or mania, a method of treatment is called for totally different from that used in the ordinary attack, or in that accompanied with great coldness, severe pain, rigors, or convulsions. In this third mode of invasion no cold stage is perceptible; it at once comes on with stupor, delirium, or the ravings of mania. In that case, if the pulse be full and slow, or hard and frequent, and the habit of body plethoric, as is frequently the case even in advanced life, we must have recourse to depletion. Not opium in this case; not, however, for the reason that perhaps some of you may give, because it proves a direct stimulant to the system; no, but because it retards the action in the smaller vessels, and thereby crowds the larger. Do you want the proof of this? You have ocular demonstration of it in the experiments made by Dr. Monro upon frogs. You also have it in the experiments made by Dr. Bard upon himself—see his thesis. But if it be not the property of a sedative to diminish sense and motion, then opium may be called a stimulant; and if it be the property of the stimulant to excite sense and motion, then opium is assuredly sedative.

But to return. Evacuations by the lancet, and perhaps by cupping, or by dividing the temporal artery, if the symptoms be urgent—by cathartics, blisters, and sudorifics, (such as cream of tartar, *sp. mind.*, &c.) to diminish the quantity of circulating fluids, which especially oppress or irritate the brain, must be employed. The vital functions being thus attacked, the most active measures become necessary.

In the 188th No. of the Medical and Physical Journal, this practice is recommended as a new practice! and announced as a great discovery; and lately the same practice of blood-letting has been recommended in the treatment of typhus by Walsh of Edinburgh, and by Dr. Armstrong in his late work on the same subject, as a novel treatment. Venesection in intermittents, and in typhus, is a doctrine which has been well understood and practised in this country for many years, and taught in the University of Pennsylvania by Dr. Rush, and in this college. I also taught it in the very first lessons I ever delivered on the treatment of fever. All light does not proceed from the east. I had almost said, that Dr. Rush alone has done more towards introducing an efficient practice in the treatment of diseases, than all his cotemporaries in Europe or any

other parts of the world collectively have done. But caution is no less necessary in discriminating between those cases where such active treatment is called for, and those where it is inadmissible; we otherwise may extinguish life instantaneously, for fever in this invasion is sometimes immediately fatal. But again; do not suffer the life of your patient to be sacrificed in this apoplectic form of fever for the want of the lancet, because forsooth it is symptomatic of the invasion of an intermittent, in which blood-letting in general is not advisable or necessary. Venesection, in the cold stage of an intermittent, has been lately recommended in the *Edinburgh Journal*, as if a new practice. It has been long since well understood in the United States. Be cautious, too, not to commit yourselves by denominating this form of fever apoplexy, for your patient in a few hours may be relieved, and the want of discrimination in you be censured for not foreseeing this result.

Purges, in like manner, are generally improper in the first or cold stage of fever. So also, are such drinks as cream of tartar and tamarinds, &c., but they are not improper in the present state of stupor or phrenitis; they are now indicated. And recollect, too, that cathartics are not only indicated for the purpose of diminishing the fluids of the system, but also to transfer excitement from the brain, and thereby also to lessen the quantity of fluids there determined by such irritation. With this view, saline cathartics, or stimulant cathartics, composed of jalap and calomel. are to be preferred. I cannot, however, too severely reprobate the use of the small doses of calomel, usually and promiscuously prescribed under the appellation of fever powders; they are indeed fever powders, for they most effectually continue fever. Calomel, as a cathartic, in the beginning of fevers, is among the best that can be employed, and occasionally too, may be administered in the progress of the fever. It excites a degree of nausea, sometimes vomiting; unloads the biliary organs, dislodges scybala, invites a large secretion into the intestines; and afterwards, in unison with antimony, has a sensible effect upon the surface, as well as the excretory organs in general. Such purgatives as excite the whole system, as does colocynth, gamboge, &c., are to be avoided. This is where cathartics are indicated to empty the intestines, and thereby to prevent the absorption of the contents

of the belly, which, as a means of repletion, would aggravate the disease, while by their quality they would add to the malignancy of such fever. Castor oil is frequently prescribed as a domestic purge in the beginning of fevers; as a means of emptying the intestinal tube it is effectual, but not so in its operation upon the liver, or the excretions of the general system. Enemata are also indicated, as more immediate in their operation than cathartic medicines.

In the treatment of fever it frequently becomes necessary to combine all your forces, and as nearly as possible at the same time, and not in the successive and inefficient manner that we see remedies often directed. Such procedure is similar to that of a commander who suffers his army to be cut off, regiment by regiment; whereas, by one general engagement he might have been sure of victory, and that with a small loss of his men. Thus in fevers the powers of life are gradually destroyed by the continuance of the disease, and the many repeated, feeble and insufficient attempts in succession to bring about a cure—whereas, by summoning all your resources at the same time, you put the enemy to flight, and prevent that loss of strength that otherwise would be the result. We should not wait in such cases for the slow operation of cathartics, and which are rendered still more slow by the influence of the fever upon the system, but immediately administer the domestic injection, by which you will remove a great additional source of irritation from the bowels. Take oil, molasses, or honey; common salt, aa \mathfrak{zss} .; water $\mathfrak{℥i}$. M.; or equal parts of milk and water; or soft soap, \mathfrak{zii} ., water $\mathfrak{℥j}$.; or which is still more active, castor oil, \mathfrak{zss} ., glauber salts, \mathfrak{zss} ., aq. pluvial. $\mathfrak{℥i}$. M.

Blisters are another means of diverting the excitement from the brain to the surface of the body, not by the mere discharge of fluids they occasion, but by the excitement they produce upon the surface, or to the part to which they are applied. Such, too, is the opinion of Dr. Jackson, that they produce their good effects by the local affection they create.* Armstrong, too, highly approves of blisters, as among the means of breaking up febrile action. But even the derivation of the fluids in these cases is useful, by abstracting them from the brain to

* Jackson on Fevers, 224.

which they tend, and the sooner blisters are applied the better. They should be applied behind the ears, between the shoulders, to the wrists, to the ankles, or to the præcordia; that is, to the most sensible parts of the body, for the very purpose of creating new and powerful excitement.

Sudorifics also constitute an important class of remedies in this stage and state of fever—that is, such sudorifics as at the same time that they relax the surface of the body, also diminish excitement in general. The *sp. mindereri*—*aq. acetat amm.*, may be advantageously combined with a portion of *tart. antimony*. Antimony, in some of its forms, especially tartarized antimony, the tartrite of antimony and potass. *gr. ij.* in eight doses, with cream of tartar, *ʒij.*, or in sweetened water alone. *Vin. antimoniale*, *xxx. gtt.* to *ʒi.*, the *pulvis antimonialis*, that is, the *antim. calc. phosph. gr. iv.* to *gr. vi.* every two hours, in syrup. The real James' powder, from *gr. x.* to *gr. xv.* or *ʒi.* every two or three hours, or combined with calomel, from *gr. iij.* to *gr. vi.* of each combined, repeated every three hours. These diaphoretic or sudorific medicines should also be aided in their operation by suitable drinks. When the patient is in the use of antimonial medicines, his drinks should be some of the following: toast water, catmint tea (*nepeta cataria*), balm tea (*melissa officinalis*), common tea (*thea viridis*), bran tea, rice or barley water. But when the patient is not in the use of antimonial medicines, he may make use of other drinks, which he will find both more grateful and useful during the heat and thirst of fever, as lemonade, apple water, tamarind water, currant jelly and water, molasses and water with the addition of a small quantity of vinegar; this is commonly called switchell by our eastern brethren, and a most excellent drink it is too in fevers, unless the bowels may be too freely opened. It is frequently directed by me in the hospital. Vinegar whey, too, is another valuable drink in this excited state of the system; but these acid drinks, taken during the use of antimonial medicines, are frequently attended with pain in the bowels, and in some instances they render those medicines dangerously active. They should give place, therefore, to some of those before enumerated.

LECTURE XX.

THE GENERAL TREATMENT OF FEVER.—TREATMENT OF THE SECOND STAGE.

THE treatment proper to be pursued in the second or hot stage of fever, is now to be noticed. This stage may, with great propriety, be denominated a state of simple excitement; that is, as opposed to the heat and complicated excitement which most frequently appear in the typhoid state of fever. The symptoms which indicate the high excitement which marks the second stage of fever, now to be noticed, have already been minutely described, viz. the frequent and hard pulse; respiration hurried; the heat increased; the skin hot, flushed, and dry; the eyes loaded, especially the adnata; the excreting surfaces shut up; the tongue white, dry, but not foul, as in typhus fever; belly costive; urine high coloured; the menses, as well as the other excretions, affected, for the most part diminished; but if flowing, excessive. Yet notwithstanding all these evidences of high excitement, there is no proof or symptom denoting the putrescent state of the body called typhus. It is therefore a state of high excitement simply. The system is under the impulse of violent action in every part of it. The indication in this state of things, therefore, is apparent; viz. to lessen the excitement in the vascular as well as the nervous system, more especially in the former. The means of fulfilling this indication are,

I. By venesection, general and local, and by both, if a local determination to the head or throat should make it necessary: but in the use of the lancet, or of local blood-letting, whether by cupping or by leeches, we should keep in view the character

and ordinary termination of the fever for which we prescribe. We should know if it be pure synocha or inflammatory fever, or if only the second stage of an intermittent, or if it be the yellow fever, typhus fever, puerperal fever, scarlet fever, or spotted fever; all which have different terminations, and exhibit different types, according to the local circumstances under which they present themselves. These are questions always to be asked and answered before we prescribe; that is, we must look to the remote cause as well as the proximate. Dr. Caldwell wonders why Dr. Cullen should enjoin this subject of attention; for he asks, What can this have to do with the indications of treatment? I say, this should always be kept in view as governing us in the use of all the remedies we are to employ, at least as it regards the extent to which they are to be directed. But in all these diseases the lancet may be employed, and may be necessary, if the excitement be excessive; for in all it has occasionally proved serviceable. But as to the degree to which it may be carried, we must decide from circumstances; such as the nature of the remote cause, the prevailing diseases, the climate, the season of the year, the habit of the patient, the time of life, and other circumstances—as the appearance of the blood drawn—I mean as it regards its consistence, its dark colour, the force with which it flows—but not the buffy coat, so constantly but so fallaciously made the test of the necessity of blood-letting. On the contrary, Dr. Huxham, Manning, and Dr. Rush, all describe the buffy coat as met with in most malignant fevers, and sometimes in the advanced stage, when it had not appeared upon the blood drawn in the first. This remark is expressly made by Dr. Rush in his work on yellow fever. “In rheumatism, when cured by bark,” Dawson (p. 163) remarks, that “in all the cases prescribed for by Morton, Hulse, Fothergill, and Haygarth, the buff increased after every venesection.” In like manner, in the advanced stage of phthisis, the same appearance is observed. The buffy coat, therefore, can be no guide as to the use of the lancet.

II. Another means of reducing the excitement of fever is by the use of emetic medicines, where, from peculiar circumstances, full vomiting may be indicated by the symptoms already mentioned; but in deciding upon their use we must take into view the previous state of the stomach, its present condition as to

nausea, appetite, &c., the breath of the patient, and the foulness of the tongue. Where emetics can be safely administered, they are frequently given with great advantage, not only by removing particular symptoms, but by procuring a solution of the fever by their operation upon the whole system; for their operation is to produce a general languor, and to act by the relaxation they produce in unlocking the secretions of the system in general. By these beneficial effects they are peculiarly serviceable in typhus fever,* and especially in bilious remittents; which last usually are accompanied with great derangement of the alimentary canal. On the contrary again, in yellow fever, in which there is always a tendency to an inflamed condition of the stomach, as in gastritis, the practice of giving emetics is very generally a fatal practice, and I may say universally condemned by experienced physicians. Caution, therefore, in the use of emetics, becomes necessary. We must accordingly know the peculiar character and cause of the disease in which we prescribe. We must not prescribe for mere symptoms.

III. A third means of removing this excessive excitement in the second stage of fever is by cathartics. The following are the means to be employed for this purpose.

1st. If the bowels have been hitherto neglected, do not wait for the relatively slow operation of cathartics, but immediately have recourse to an enema to evacuate the lower tract of the intestines.

2d. Administer the purge composed of jalap, cream of tartar, aa gr. xv.; calomel, gr. vi. M. This medicine is expeditious in its operation—produces large serous evacuations—and in a particular manner abstracts excitement from the brain and other vital organs.

3d. The saline cathartics are among the best to be employed on account of their general effects upon the system; i. e. by their operation upon the skin and the kidneys, as well as upon the bowels; and many add to these a distinct sedative or refrigerant effect upon the system, independently of their sensible

* I mean typhus fever primarily so; i. e. proceeding from contagion—passing through a family: an emetic here is peculiarly proper, and will sometimes arrest its progress.

operation upon the excretions. The first of these is Glauber's salts, (the sulphate of soda,) called Glauber's salts from Rhodolphus Glauber, a celebrated German chemist and practitioner. This is the most active of the saline cathartics, though the least acceptable to the stomach— $\bar{3}$ i. at a dose.

2d. Rochelle salts, or sal de Seignette, as it was long called after the discoverer Mons. Seignette, an apothecary in Rochelle; it is the tartrite of potash and soda. It is more agreeable than the former, but less active— $\bar{3}$ i. or 3x. at a dose.

3d. Phosphate of soda, or the tasteless purging salts— $\bar{3}$ iiss. It is much less active than the foregoing.

4th. Sulphate of magnesia or Epsom salts, so called from their being obtained from the springs of the same name—also called the bitter purging salts, the sal catharticus amarus, and vitriolated magnesia. The teacher of the *Materia Medica* will doubtless give you minute and ample details upon these subjects. The first is the most active but the most offensive; the second less disagreeable, but less active; the third, least offensive, but least active; the fourth, though bitter, generally not offensive, and very active. These are best administered in Indian gruel, sweetened with brown sugar, $\bar{3}$ i. of the salts to a pint of the gruel; in chicken or veal soup; in lemonade, or in simple water; drinking thin gruel or chicken water during the operation. The gruel is the best, most laxative, and least exciting to the system, especially in fevers.

IV. A fourth means of lessening the excitement attendant upon this stage of fever, is by the use of those remedies which operate upon the skin and kidneys; the stomach and bowels having been previously attended to. First by

1. Tartarized antimony, in small doses, sufficient to nauseate the stomach to a certain degree; for corresponding with this nausea of the stomach is the languor, deliquium or nausea, if it may be so called, of the whole system; and indeed if nausea be not always manifested in the stomach, this languor shows itself in the diminished action of the heart and arteries, in the relaxed state of the exhalent vessels, so that the distant nerves and muscular fibres feel its effects, though the nerves of the stomach may be unconscious of its operation. That antimonial medicines, particularly tartar emetic, have a peculiar operation on the skin, as Dr. Cullen supposed, independently of

vomiting, or even nausea, is proved by the experiments of Wilson, as related in his *Essay on Gravel and Dyspepsia*. See p. 64, 125.

There are various modes of exhibiting this medicine. It may be given in powder blended or embodied with loaf sugar; say gr. ij. of the tartarized antimony; ʒij. of loaf sugar, intimately mixed, and divided into eight doses, one every two hours; or dissolve two grains of the antimony in ʒij. of water, giving from one to two tea-spoonsful every two hours; or gr. ij. to ʒviij. of water, giving half an ounce, i. e. a table-spoonful every two hours. It may be objected to this solution, that it undergoes a kind of decomposition; at least that it loses its effect and becomes inert before the eight ounces are expended. To obviate this evil, give it in powder, or prepare a smaller quantity of the solution at a time.

2. Antimonial wine is another form of exhibiting antimony; but this preparation is too uncertain, and therefore now generally laid aside.

3. James' powder—I mean the patent preparation: ʒi.—divide in two or three parts, according to circumstances.

4. Pulv. antimonialis, the oxyde of antimony with phosphate of lime, formerly antimonium calcareo phosphoratum.

5. Pulv. antimonialis, with calomel—aa gr. i. every two hours, especially if the bowels be confined; but if they have been well emptied,

6. Sp. mindereri, the aq. acetatis ammoniæ, the acetate of ammonia, prepared with distilled vinegar, ʒss. at a dose. Be cautious as to the mode in which the vinegar has been distilled, lest a portion of the leaden case of the still may be communicated to the vinegar, forming an acetate of lead. This preparation is rendered still more certain in its action upon the skin by the addition of laudanum; say gtt. xxx. to ʒiij. of the former. M. Sometimes, too, advantage is obtained by combining with it from ʒij. to ʒss. of the sweet spirits of nitre to the ʒiij. of sp. mind. Murray, in his *Materia Medica*, observes that the mindereri spirit is an inert medicine! I want no other proof to show me that he was not a practical physician; for a more efficacious medicine the *Materia Medica* can scarcely furnish. Dr. Caldwell, I perceive too, in his edition of Dr. Cullen, is not practically acquainted with this medicine, for he also considers

it as an inactive medicine. Dr. Duncan, as you will see in his Dispensatory, expresses himself in terms of high approbation of the operation of this medicine. We even see its injurious and depressing effects in typhus fever, when its use may have been too long continued, or it is made use of in a doubtful state of excitement. I mean doubtful, as it regards the use of exciting or depleting means; for if wine be indicated, and the sp. mind. be given, great depression of the system soon shows itself in delirium, restlessness, &c. I have, in this way, often-times done mischief by its continuance; but by thus knowing its injurious effects when improperly administered, I have been enabled to do more good with it where the state of the system calls for its use.

7. Sal diureticus, acetate of potash, ʒij. saturated with vinegar, made into a draught, is particularly indicated to act upon the kidneys, when the secretion of urine is much diminished, as well as the skin dry.

8. Citrate of potash, ʒi. of the carbonate to ʒss. of lime-juice—aq. font. ʒiij—lavand. ʒij. to be given in cases in which the stomach is much disturbed, as in yellow fever, or by previous excessive vomiting. This, though not so efficacious, like the sp. mind. I have also seen much abused by being persisted in, in the advanced state of typhus.

9. Another useful diaphoretic is Glauber's salts, in small doses; viz. ʒi. divided into eight parts; i. e. of ʒij. each. This was a favourite prescription of the late Dr. Kuhn, Professor of the Practice in the University of Pennsylvania. In some instances he combined with it two grains of tartarized antimony to the ounce, with the view of securing its effects upon the skin, or the superficies, as he denominated it. In all febrile diseases his attention was specially directed to the function performed by the skin.

Among other favourite prescriptions of this most excellent physician, in the treatment of fever, and as a means of diminishing the action of the blood-vessels, and of relaxing the superficies, was,

10. The combination of the nitrate of potash with tartarized antimony, viz. ʒij. of the former, with two grains of the latter, divided into eight doses, one to be given every two hours. My intimacy with my fellow student and friend Dr. James, then

the private pupil of Dr. Kuhn, and since the Professor of Obstetrics in the University of Pennsylvania, gave me an ample opportunity of witnessing the frequency of this prescription, as well as the former, in his practice.

11. Another combination, much made use of by the late Dr. Bayley of this city, as well as by Dr. Post, was that of the super-tartrate of potash; i. e. cream of tartar, ʒij. with two grs. of tart. antimony, intimately mixed, and divided into eight doses; one every two hours. It is proper here to remark that this prescription, probably owing to the predominance of the acid, is somewhat uncertain in its operation. In some cases I have known it to prove very excessive in its effects. In one case it was administered in a pleurisy, after venesection, and a cathartic had been given: it produced a profuse evacuation by the bowels, and prostrated the patient before I could direct any thing to restrain the inordinate discharges it had occasioned.

V. Among the means of diminishing the excitement of the system, is that of lessening the heat of the body by the direct application of cold, either in the form of cool air or cold water. The latter may be applied both internally and externally; for heat, as before observed, when excessive or accumulated in the system, becomes an additional stimulus, and an aggravating source of excitement and fever.

To Sydenham we are much indebted for the introduction of cool air into the chambers of the sick. To Dr. John Gregory; to Dr. Haygarth, by his introduction and establishment of fever wards; to Dr. De Haen of Vienna; to Dr. James Gregory, the late Professor of the Practice of Physic in the University of Edinburgh; to the late Dr. Wm. Currie of Liverpool; to Dr. Wright of Jamaica, and lately of Edinburgh; to Dr. Robert Jackson, the author of the very valuable treatises on fevers, (for his works are valuable notwithstanding the fluctuation his mind had undergone on the subject of fevers,)—I say, to these writers the world is indebted for the introduction of cold water in the various external modes of its application in the treatment of fever. And I may add, that to many of the last mentioned physicians, Dr. Currie especially, we are to ascribe the revival of the ancient practice of administering cold water, and other cool drinks, during the hot stage of fever, as well as its application to the surface. I mean the practice which you will

find recorded in the writings of Galen, of Avicenna, of Rhazes, of Aëtius, and of Celsus.

Galen considered cold water a most important remedy in fever; so did Avicenna, Rhazes, and other Arabian physicians. Aëtius advised total abstinence from liquids at first, until the thirst was augmented; then he allowed the most free indulgence in cold drink. Celsus followed him, by allowing the most copious draughts of cold water in the height of the fever—but not until great heat and thirst called for it. *Lib. iii. cap. 7.* Afterwards, until the cold regimen was introduced by Sydenham, the alexiphermic or heating system prevailed, by which the patient was suffocated by heat, by hot drinks, and loads of clothing—scarcely exceeded by the suffocating vapour-baths of the itinerants now travelling through our state, to the great destruction of those who are exposed to their frauds and their quackery.

Extremes are to be avoided—the indiscriminate use of cold applications, as well as the means of accumulating and increasing the heat of the patient. We are to recollect that the skin performs the important office of conveying out of the body two sources of irritation or excitement; namely, the saline materials which compose the perspirable fluid, and caloric. I might add three, for the quantity of fluid evacuated by the skin is another means of diminishing excitement, as far as the volume or quantity of fluids may be the cause of fever, or may have agency in the continuance of it; but the two former, viz. the saline matter and caloric, have manifest influence when retained, in augmenting febrile action; for to remove heat, without attention to the other matters discharged by the surface, is not sufficient, if we wish to remove or to guard against all the sources or consequences of febrile excitement. Cold washing and cold drinks may diminish temperature alone, but they are not calculated to continue the discharge by the skin, which is to remove the noxious materials we ordinarily pass off through that extensive outlet to our system. Dr. Currie even has been too inattentive to the nature of this function, and the chemical properties of the matter evacuated—ascribing too much to mere temperature, and neglecting the materials which are conveyed out of the body

by this discharge. Examine and inquire for yourselves. Attend to this subject in all its relations to the present state of chemical science. Here, too, is presented to you an excellent theme for an inaugural exercise. The qualities of the materials passing off by the skin, and their effects when retarded or obstructed in producing febrile action and a vitiation of the system; or another subject, the use and abuse of cold water in fevers.

When, then, at what stage of fever—under what circumstances, are cold water and cold drinks to be employed? I answer, during great heat and excitement of the body, when the skin is dry and flushed; and then they are to be employed merely for the purpose of abstracting the superabundant heat or caloric, which, by the excitement or irritation of the exhalents, prevents the discharge of the perspirable matter. Accordingly, perspiration flows after the use of cold applications and drinks. But if they be afterwards continued, that very discharge is restrained which they have been the means of effecting. Tepid drinks, not cold, are then to be administered, and cold applications should be suspended while such discharges from the surface may be continued, for no more effectual means of diminishing temperature can be employed than the discharge of the perspirable fluid from the surface.

Dr. Currie's remarks on this subject deserve your attention. "The safest and most advantageous time for using the aspersion or affusion of cold water; i. e. at the temperature between 87° and 75° of Fah. is when the exacerbation is at its height, viz. from 6 to 9 P. M. But," he adds, "it may be safely used at any time, when there is no sense of chilliness present, when the heat of the surface is above what is natural, and when there is no general or profuse sensible perspiration." He also prohibits the use of it in cases of diarrhœa or dysentery. In that respect, Dr. Thomas has certainly erred, by the prescription of cold drinks and cold applications in diseases of that description, not adverting to the injury they produce in all diseases attended with local inflammation.

How is cold most advantageously applied? By cold affusion? By cold washing? I answer, by a better mode, by means of a sponge, which, successively applied, reduces the temperature several degrees lower than simple affusion. The relative advantages attendant upon this mode of applying cold

water were well ascertained by Dr. Gregory in the Infirmary of Edinburgh, and by Dr. Currie of Liverpool, in the numerous cases of typhus that those cities presented, especially among the poor resorting to their public hospitals. The same results were exhibited, not only in the private practice of Dr. Bard and myself, in the treatment of yellow fever, but also in numerous cases of that disease, as they appeared in the New York Hospital.

In my own case, when attacked with that disease in 1798, I had recourse to the same practice, of washing my limbs with cold vinegar and water by means of a napkin, repeatedly applied in succession to the different parts of my person; at the same time making use of cool water as my drink. Very generally it was succeeded by a profuse perspiration, which was afterwards continued by tepid, not hot drinks—such as toast water, common tea, or a cup of balm or catmint. It may in this place be remarked, that the external application of tepid water, i. e. warm, not hot, say from 87° to 97° of Fah., also reduces the temperature of the body, especially when the sweat is flowing and the temperature exceeding $97\frac{1}{2}^{\circ}$, the natural degree of heat. Indeed it appears to me, that it more effectually carries off the superabundant caloric than cold water, as it is more readily converted into vapour, by which the body is left relatively cool; and that without the check of the perspiration produced by cool or cold applications.

Dr. Currie admits, that “in many cases the heat of the body is lowered as speedily by the affusion of tepid water as by the affusion of water that is cold.” He adds, if I mistake not, in some cases the heat is lowered more speedily by the tepid water; i. e. the evaporation from the surface is more copious from the tepid affusion, and on this the cooling of the body very much depends. But this is not all: the tepid affusion is little, if at all, stimulating, and does not, like the cold affusion, rouse the system to those actions by which heat is evolved, and the effects of external cold resisted. He concludes, “it very generally produces a considerable diminution of heat, a diminished frequency of pulse and respiration, and a tendency to repose and sleep.”

Cold drinks, it may be added, are productive of great irritation or excitement, given while the perspiration is flowing.

Tepid lemonade, teas moderately stimulating, especially in those fevers where the stomach is irritable, as in the yellow fever, should now be prescribed. The *nepeta cataria*, the sage, (*salvia officinalis*,) snakeroot, (*aristolochia serpentaria*,) and the boneset, (*eupatorium perfoliatum*,) may be now advantageously directed, as well calculated to preserve the perspirable state of the surface. They are accordingly among the most valuable of our domestic remedies in fevers. Many families place an exclusive reliance upon those natural febrifuges of our country, and rarely resort to the physician. In the present state of the practice of medicine, in which the physician places his reliance upon mercury, I believe they are right. This is certainly confirmed, as it regards the yellow fever. Richardson Underhill of New York, and John Vaughan in Philadelphia, certainly were more successful in the treatment of that disease than the greater part of the graduated doctors of those cities.

I have already mentioned the virtues of the sage, and the celebrity it possessed in former days. *Cur moriatur homo cui salvia crescit in horto?* was proverbially said of this plant. The snakeroot became no less esteemed for its febrifuge virtues. The *eupatorium perfoliatum*, or boneset, now enjoys equal reputation with either of the plants mentioned, and to that it is justly entitled. Indeed, I consider it as superior to either of them in its sensible effects upon the functions of the system. The infusion of this plant, when given warm and of considerable strength, possesses active emetic qualities. It also acts upon the bowels as a cathartic, at the same time that it operates upon the surface as a powerful sudorific; afterwards given in the form of the cold infusion, like the bark and other bitters, it is a valuable tonic. It is generally remarked, that every climate and country furnishes its specific against the diseases of that country. In this plant it is peculiarly true that it possesses all those medicinal qualities which constitute it an antidote to the fevers of this climate; exhibiting all those medicinal operations upon the system that are obtained from the James' powders.*

* See Dr. Anderson's Inaugural Dissertation on the *Eupat. Perfol.* His experiments upon its medicinal operation, and his chemical analysis of it, form a model deserving your imitation, in preparing a dissertation upon any similar subject.

What is to be the *food* of the patient in this stage of fever? I answer, bread and water, or a diet very little departing from this simple fare—a dish of tea with a piece of bread, dry toast, or a biscuit; a cup of gruel; some stewed or roasted apples, or peaches; or at most, a little boiled rice or barley, is to be occasionally allowed: for the strictest abstinence should be enjoined in this state of increased excitement. And unless the physician gives particular attention to the diet of the sick, directing both what the patient is to eat and drink, and what he is not to eat or drink, proscribing as well as prescribing, he will find that the kindness of the nurse, or too kind friends and attendants, will, by their panadas, their calves' feet jelly, their meat soup or beef tea, their custards, or other good things, soon bring about a renewal of fever, and thus counteract all the benefits which may have been otherwise obtained from his advice. Another very important direction to be given in fever, especially if typhus fever be apprehended, either from the original cause of the disease or from the long continuance of it, is to confine your patient at this time to vegetable nourishment, avoiding animal food altogether, even in the shape of soups, so frequently but improperly given in fevers and febrile diseases. Animal food, at this period or stage of fever, in this high state of the excitement of the system, is too stimulant at all events, independently of its greater tendency to the putrefactive fermentation, and the vitiation of the system to which it gives rise, and to which the body at this time is peculiarly predisposed. No less attention should be given to the *regimen* of the patient than to his diet. Your attention should be directed, first, to the air of the room, both as it regards its quality and its temperature. Upon being called to a patient in fever, and it is likely to be of any duration, especially if of the typhoid character, and particularly if it occur in the warm seasons of the year, endeavour to place him in an apartment which is sufficiently large, and which you can at pleasure ventilate. If possible, too, obtain for him a room with a fire-place; the circulation of air which this secures is of great importance to the sick. Another good rule is, to place the bed at a little distance from the wall, that the patient may avoid the current that takes place upon the sides of the room. Avoid also the lodgments of air that are apt to take place in the corners of the room, by

placing the sick nearer the centre of the apartment. With regard to temperature, it should not exceed 60° or at most 65° of Fahrenheit, pineapple heat. Preserve your patient, too, from all exercise, both of body and mind, as far as possible. Attend likewise to his clothing, that it be of a proper sort, and frequently changed. Remember flannel or cotton worn next the skin in this climate, as I have before remarked, is preferable to linen, especially in fevers. But frequent changes are indispensably necessary. Look too to the bed and bedding of your patient. In winter, a feather bed is allowable, and really more comfortable, and in most cases is really more beneficial to the sick; but in summer the mattress is to be preferred, as less heating to the body. The curtains of the bed should be totally removed in summer, and in winter they should be frequently thrown aside, for the purpose of admitting fresh air to the person of the patient. In summer, the bedding should be light, consisting of a sheet and a single blanket, and these should be frequently changed; a less quantity, even in the summer season, would not be sufficient to secure the perspiration which is necessary in the treatment of all fevers. But in winter, an additional blanket or coverlet will be called for. But I beg you to guard against the common error committed in the sick room, that of loading the patient with bedclothes; for the very accumulation of heat becomes of itself a sufficient stimulus to renew the fever that may have just terminated.

LECTURE XXI.

THE GENERAL TREATMENT OF FEVER.—TREATMENT OF THE THIRD STAGE.

WE now proceed to the third stage, usually denominated the sweating stage of fever. This has been induced either spontaneously, or by the means that were employed for the purpose of diminishing the excitement which has constituted the two preceding stages. In either case, a question occurs—Is the second stage completely terminated? Has a perfect apyrexia or absence of fever been induced? Or does the febrile excitement still continue?

If the patient be free from fever, his pulse is generally reduced to its natural frequency and softness; his respiration has become natural; his skin is moist and of its ordinary temperature; his tongue moist and becoming clean, with a plentiful secretion, particularly from its edges. I speak of apyrexia after simple excitement, not in the compound or complicated excitement of typhus fever, in which case, though the fever be ended, the tongue may still be foul, and even the arterial system manifest some irregularity. The urine is thick, high coloured, and deposits a brick-dust sediment; his feelings and state of mind are again recovered, except that he is sensible of more or less debility and languor. If the sweating be now continued, a still greater expenditure of the patient's strength takes place; his extremities become cold by the evaporation produced, and if he be of a slender habit of body, or he is debilitated by age, his prostration may be such that his life may be in danger. It becomes necessary, then, to restrain the discharge by the skin. How is this to be effected?

1st. By change of his dress, and the admission of air to the surface of his body; by changing his bed and bedding, and by diminishing the quantity of his bedclothing.

2d. By the administration of stimulant food and drinks, and especially by cool drinks. A cup of tapioca, the fecula obtained from the *jatropha manihot*; of arrow root, obtained from the *maranta arundinacea*; of sago, from the *cycas revoluta*, or *circinalis*; of salep, the produce of the roots of the *orchis mascula*, or the *orchis morio*; of panada, prepared from wheat bread and water, boiled; of caudle, made by boiling oatmeal, or common cornmeal, or Indian meal gruel. Either of these, with the addition of wine, sugar, and the spice of nutmeg, (*myristica moschata*) or cinnamon, (*laurus cinnamomum*) may now be advantageously administered to the sick. Or a wine toast, with the before mentioned additions, may be given him; or a cup of porter and water, with a small quantity of nutmeg added to it, and gratefully sweetened, will be peculiarly useful and agreeable to the sick. Vegetable nourishments, too, it should be recollected, are preferable, if you have reason to suspect either a continuance or renewal of the fever, or a typhoid tendency likely to supervene. But even if a perfect apyrexia has been induced, animal food should be cautiously made use of, even in the form of soups. And when soups are given, they should be made of the less stimulant meats, as chicken or veal, and then prepared with a variety of vegetables, such as celery, (the *apium graveolens*,) parsley, (the *apium petroselinum*,) an onion, (*allium cepa*,) turnips, (*brassica rapa*,) carrots, (the *daucus carota*,) barley, (*hordeum distichon*,) rice, (the *oryza sativa*,) &c.

But if the stomach has been much debilitated and disturbed with flatulence and indigestion, and the patient be much reduced in strength, and the apyrexia is so perfect that there is no reason to apprehend a return of fever, then a small quantity of animal food, broiled or roasted, may be made use of, especially a broiled bird. And it may be rendered more stimulating by the usual condiments, such as salt, pepper, and mustard, or a cup of brandy, or spirits and water. In that case, soups and vegetable nourishments, especially the more acescent vegetables, should be avoided, as in a weak stomach they readily run into fermentation. Some medicines, too, are to be

administered, to prevent the recurrence of the paroxysm, and to build up the system. These will be hereafter noticed.

But it is very possible that the sweating stage, which has been induced, has only afforded the patient a very partial relief—a mere remission or abatement of his symptoms. His heat is still continued, though his skin be moist; his pulse is still more frequent than natural, or if not more frequent, it is still manifesting a degree of hardness and irritation in it, perhaps both. But recollect, that the frequent pulse may exist without fever, as we see in the debilitated habit of body, from whatever cause; but we see this frequency, especially in the debility attendant on convalescence, and in persons of a susceptible state of nervous system. His respiration, too, is in proportion frequent; his excretions by the skin and the kidneys are less copious than they should be; some stricture on the extreme vessels yet remains:—there is still some irritating cause operating upon the system. This source of irritation may be in the intestinal canal, or it may be in the blood-vessels; i. e. in the condition of the fluids of the system. In the first place, it may have arisen from miasma, which is still operating upon the body, which, perhaps, has been long exposed to its action, and thence has become saturated with such miasma. This is frequently the case, when it is the cause of remitting, as well as intermitting fevers, especially in the autumn, in a warm climate, and after a hot summer.

2dly. The fever may have been generated in the system, and have derived its origin from a colluvies in the bowels, which is not unfrequently the case in hot climates, and in the summer and autumn of temperate climates. Bilious remittents, with a typhoid tendency, are thus frequently engendered, independently of external causes. This type of fever may have been generated in the system by causes not confined to the bowels, viz. by a scorbutic habit of body; the effects of a bad diet, want of fresh vegetables, by bad air, living in foul and confined apartments. But whatever may have been the exciting cause of the fever so induced, such fever has at least a great tendency to assume the typhoid character, in consequence of the circumstances just mentioned. Jail, typhus fever, and dysentery, are oftentimes thus induced; or,

3dly. The fever now existing, may be the effect of conta-

gion, a "*materies ab extra*," introduced into the system. It may be small-pox, measles, chicken-pox, scarlet fever, plague, yellow fever, the various forms of typhus fever, spotted fever, remitting fever. In these cases, the continuance of fever is to be looked for. While the excitement continues, but is unaccompanied by symptoms of putrescency, continue the use of the remedies which have been already recommended, especially those necessary to keep the bowels open, and to preserve a continuance of the excretions by the skin and kidneys. For this purpose, enemata should be daily administered, together with the internal use of cathartic and sudorific medicines, as combinations of antimony and saline medicines, as Dr. Kuhn's prescription. If the action of the vessels be kept up, tepid washing should also be frequently renewed. Should it prove an eruptive fever, the excitement must soon produce an eruption on the surface of the body, or the poison must soon wear itself out, or perhaps be eliminated from the body altogether, by persisting in your attention to the excretions. But if otherwise, and you have reason to believe it a remitting form of fever, or of a typhus tendency, pay constant and daily attention both to the bowels and skin, as among the best means of counteracting a vitiated state of the fluids, and of terminating the fever. And if it be a fever from contagion, it will pass through its ordinary course, with less injury to the system, while these discharges from the bowels and surface are preserved, and the excitement of the system, if I may so express it, is divided among the functions of the body. But in a case of continued fever, properly so called, if these functions are all attended to, and prove insufficient to effect a complete solution of the fever, lose no time, but proceed upon the principle of converting a general into a local irritation, by the free and repeated application of blisters—for blisters are now especially serviceable. The system is yet very sensible to the impression they produce upon it, and there is less danger now to be apprehended, either from the debility occasioned by the discharge they produce, or the exhaustion of the tone of the parts themselves to which they are applied, than at the more advanced stage of the disease—for in the latter stage they are oftentimes attended with dangerous consequences, both to the whole system and to the parts of the body to which

they are applied, by inducing sphacelus. But in the present stage they are frequently serviceable, by producing a concentration of all the irritations of the system upon the parts now acted upon, analogous to the critical eruptions in fevers, or to the effects of salivation or other critical discharges, as excessive sweating, diarrhœa, urine, or sometimes by hemorrhage. The inflammation of blisters is no less critical and serviceable in many instances. But do not postpone their application, as was formerly too much the case with practitioners. Hence the old prejudices, and which are still occasionally met with in the sick room, that the case is a hopeless one when blisters are made use of. In the last stage of fever, it is well known, that they are rarely employed with benefit, except for the relief of particular symptoms; as for coma, in the advanced stage of typhus, in irritation of the stomach, in yellow fever, oppressed lungs from congestion, in peripneumony, in the inflammation of the intestines in dysentery, or of the peritoneum in puerperal fever. Some physicians, indeed, reprobate the use of blisters in all stages of the typhoid form of fever. Dr. Moore never thought them useful in fevers of this character. See his *Sketches*, p. 531. I confess, I never saw them do much good in the more advanced stage of typhus fever; but in the early period, they are among the best means of arresting general fever, and of directing its violence to the local irritation produced. For this purpose, then, when you have failed by the remedies already enumerated, have recourse to blisters. Apply them successively to the wrists, to the ankles, behind the ears, between the shoulders, to the chest, to the pit of the stomach, or to the hypogastric region, according as the head, the lungs, the stomach, the intestines, the bladder, or the uterus, may be more peculiarly affected than other parts of the system. But if the fever be general, without such local tendencies, apply first a pair of blisters to the forearms, and when you may have obtained their full effects, and the fever is still continued, (allowing a reasonable time for the excitement produced by the blisters themselves, say three or four hours, to subside,) apply another pair to the ankles, or to the inside of the thighs.*

* Riverius, speaking of malignant fevers, and of the advantages derived from blisters, observes:—"Ubi maxima est malignitas, unicum vesicatorium non

Blisters in an adult, under ordinary circumstances, in order to produce their full effects, should be applied, eight, ten, or twelve hours; not so in the more advanced state of fever, or in children. In this state of fever, in the case of an adult, six or eight hours, and to children from two to four hours, will give you all the local excitement and inflammation you will wish to be produced by them. Do not wait for the elevation of the cuticle, for upon the first dressing afterwards, you will find that an effusion of serum will have taken place. You must be precise in your directions on this subject, or they will be too long continued. In cases of sphacelus of the parts, as in the ulcers from burns, or where blisters have been applied, yeast poultices are frequently applied; but the best application I have found is an ointment composed of the acetate of copper and cerate, or hogs' lard, from three or four to ten grains to the ounce.

If by these means you do not succeed in obtaining a crisis in the fever, you have now reason to look for a different state of things. You have grounds to anticipate a secondary fever; or that stage of fever which arises from the deranged state of the fluids, now appears. For the fever being continued, mere action alone, long-continued, will produce such a derangement of the whole system, and of the excretions, that typhus, in other words, a vitiation of the fluids, constituting their putrescent tendency, is inevitably the consequence of such continuance of febrile excitement.

The system now being more debilitated, and consequently more irritable; the state of the fluids, too, being changed, become a greater source of irritation to the heart and arteries. Hence, then, the pulse becomes more frequent, small, and irregular. For the heart and arteries, like the other parts of the system, become morbidly sensitive, even to ordinary impressions; but much more so to any new impressions that may be made upon them. Now fear, any sudden impulse of mind, or agitation of the body, even the muscular exertion of getting in or out of bed, or of changing his clothes, will affect the patient. Every new object that comes before him excites his

sufficit, sed plura admovenda sunt; soleo ego in magna morbi sævitia, quinque locis admove, cervici nimirum, utrique brachio, parti interiori inter cubitum et humerum, et utrique femori, parti etiam inferiori inter inguina et genua, cum felici successu." Riverii Opera, p. 541.

vessels to more frequent action—light, noise, conversation, all act upon him. Every evacuation from the bowels now adds to his irritability, which shows itself no less in the blood-vessels than the other parts of his system. An obstruction of the bowels, the retention of urine, even the continuance in one posture, affect him in this respect very sensibly. The respiration, too, becomes hurried and irregular. The heat now shows that peculiar biting quality that we have before mentioned. The skin, too, becomes dry. The brain is also more or less disturbed, showing itself in the mind and body, or sometimes appearing in the form of stupor. This is a common occurrence. Hence the origin of the term typhus, which signifies stupor. It is also traced to the verb *τυφω*, to inflame, denoting perhaps the extraordinary heat of this form of disease; or it may be referred to the inflammatory stage that frequently precedes it. His eyes become insensible to light—they remain half closed. His senses, indeed, are variously disturbed, sometimes excessively alive to impressions; at other times he is totally insensible—sight, hearing, taste, smell, feeling, are all morbidly affected; indeed, all these senses are in a state of paralysis. Great restlessness, perhaps coma, succeeds. Subsultus tendinum and delirium follow—even his sleep is disturbed by dreams. This determination is more especially troublesome at night, but not so early in the day. Involuntary discharges, too, take place by urine and fæces. These, too, become more offensive, as well as his breath, and the other discharges. The cause of this continued irritation is now referrible to the first exciting cause, as miasma or contagion; to the condition of the fluids, induced by the retention of the natural excretions; by the absorption of the vitiated secretions and excretions; and, possibly, by some change which may have been wrought by the vascular system itself upon the fluids. If the vessel operates upon its contents in the process of secretion, it certainly may also act upon the circulating fluids. Indeed, we have the evidence of some such action in the changes effected in the lacteals, and in the process of sanguification. The effects of climate and season are also to be taken into consideration, in accounting for the obstinacy and the duration of the fever, and the changes now taking place in the system. Another possible source of such vitiation is, perhaps, to be found in the atmosphere to which the patient

may have been exposed, as in prison, on board ship, in a crowded hospital, or in a garrison.

Puerperal fever at Aberdeen, and at Edinburgh, is thus rendered typhoid in the lying-in wards of the infirmary, owing to the presence of typhus fever, which gives that type or character to every inflammatory disease, especially puerperal fever. Hence the difference of opinion among writers, relative to the inflammatory or the typhoid character of that disease; some contending for its exclusive inflammatory type, others that it is always of a putrid tendency. Even the want of cleanliness in some private families, gives a malignancy to a disease that is not otherwise of that character. Dysentery, by such neglect of personal cleanliness, is thus rendered contagious, even in the otherwise pure air of the country. The confinement of the sick to small and unventilated apartments, or want of personal cleanliness in the individual, will furnish a solution of the phenomena which are now exhibited in the typhoid state of fever. What, then, are the means of arresting its progress, and of counteracting this condition of the system? These will be the subjects of the ensuing discourse.

LECTURE XXII.

TREATMENT OF THE TYPHOID STATE OF FEVER.

THE treatment of the typhoid state of fever now falls under our notice.

Dr. Sims remarks: "I shall ever fear a physician is in fault if a person dies of a fever, to whom he has been called whilst any degree of strength remained, and the patient could be obedient to his directions."* But notwithstanding this observation of Dr. Sims, there is no situation where the judgment, the skill, and the attention of the physician are in greater demand than on this occasion. There is no stage of fever more embarrassing for the young practitioner, than that which is now to be considered. But I hope to give you some facts on this subject that will prove useful to you at the bedside of the sick. I very early found them so to myself, and have since had good reason to be confirmed in their correctness.

How is this typhoid state of body to be counteracted?—In what does it consist? You will remember it consists—1st. Of debility, the effect of the long-continued preceding excitement; and consequently, as the attendant upon that debility, an increased susceptibility to impressions. 2d. In a certain degree it is constituted by a putrescent state of the system; for both of these conditions of body exist at the same time. The indications then corresponding with this state of the solids and fluids are likewise two-fold.

I. To counteract the debility which keeps up the irritable or excitable state of the system.

* Sims' Observations on Epidemical Diseases, &c. p. 87.

In this disease, as before remarked, the heart and arteries are more susceptible to impressions, owing to the debility of the system. Hence it appears, that the least bodily exertion of the patient, or the least mental irritation, excites his heart and vessels to more frequent action. Under these circumstances, the hasty observer prescribes the means of depletion, and those narcotic and other medicines usually denominated sedative, as for a disease of supposed simple excitement. But this sensibility of nerve, this hurried circulation and quickened respiration connected with it, (for it shows itself in the heart and vessels no less than the other parts of the system,) are only to be removed by stimulants, both diffusible and permanent: they only can counteract this state of the system. This is to be done, not by a continuation of depleting or evacuant medicines; not by the sedative effects of opium, camphor, digitalis, and other remedies of this nature, so generally resorted to in consequence of the stimulant operation which these narcotics are supposed to possess. Opium, administered as it is ordinarily given in typhus fever, like foxglove in dropsy and consumption, proves indeed an anodyne to your patient, for it is the passport to the grave. At least, such has been my observation of its effects; but examine for yourselves. Even opium and wine combined, and which are so frequently employed, are of doubtful effect; it may however happen that the wine by its stimulant operation, if given in large quantities, may be sufficient to counteract the sedative operation of opium. Nor will camphor be found more useful; on the contrary it is equally debilitating with opium. Its sedative and deleterious effects on the whole system are well ascertained. I have therefore proscribed them both from my practice in the advanced state of fever, with the exception of administering opium as an occasional anodyne, or for the purpose of restraining diarrhœa; but the repeated doses of it which some physicians are in the habit of prescribing, on account of its supposed stimulant effects in preserving the tone of the system, cannot in my opinion be too severely reprobated. Nor is this febrile excitement to be removed by persisting in the use of mercury, so frequently and so indiscriminately prescribed in this state of body. Small doses of calomel and antimony may be advantageously administered as alteratives before great prostration

has taken place, and especially when the bowels are confined: but if they afterwards be continued, they should be given in conjunction with small doses of opium to secure their operation upon the surface, and to prevent their effects upon the bowels. But if you depend upon the mercury's salivating the patient at this period of the disease, you will be frequently disappointed. The evacuations it occasions from the bowels will alone frequently run off the strength of the patient; and even where salivation takes place, I have known the fever, nevertheless, to prove fatal. The late Dr. Laurence fell a victim to the fever of 1798, notwithstanding a salivation was obtained. In some instances, too, it has happened that although salivation has been effected, the patient has sunk under diarrhœa, which has succeeded to this use of mercury. But it must be acknowledged that it is a very rare occurrence, that the patient has not recovered where salivation was induced; but in nine times out of ten, nay nineteen out of twenty, you will fail to induce a salivation in this state of the system, in which case the remedy produces irreparable injury. The debility then of the solids is only to be safely counteracted by the free use of stimulants, including both the diffusible and those permanent stimulants called tonics. The diffusible stimuli advisable in this state of things, are the vol. alkali and æther. In case of stupor or coma frequently attendant on the typhoid type, and in the typhoid state of peripneumony, the vol. alkali is particularly indicated. I had a case of the former in the state prison, where the pressure on the brain was such as to reduce the pulse to twenty and thirty strokes, and in all other respects the symptoms of this state of fever existed in an alarming degree. In this case, the vol. alkali was followed by the most decidedly good effects. In like manner, in every obstinate case of peripneumony, the most beneficial effects were obtained from the use of this medicine. In the typhoid form of that disease, this medicine may be given in various forms; it may be given in bolus of v. gr. or vi. gr. of the carbonate of ammonia made up with the conserve of roses; or dissolve $\mathfrak{z}\text{i}$. in $\mathfrak{z}\text{vi}$. of mint water, and add $\mathfrak{z}\text{ss}$. of lavender to the mixture— $\mathfrak{z}\text{ss}$. to be given every two hours; or it may be administered in the form of aq. ammon. xv. gtt. or xx. gtt. every two or three hours in the drinks of the patient, or in sweetened water. Or it may be

prescribed in the *sp. ammon.* or the *sp. ammon. aromat.*, which is the most elegant form of giving that medicine, and is most grateful for internal use.

Æther, either the sulphuric, or that form of it called the anodyne liquor of Hoffman, may also be given in the typhoid state of fever, especially for the removal of delirium and *sub-sultus tendinum*, with the best effects—from twenty to sixty drops of this liquid should be frequently administered, say every two or three hours, in a little sweetened water. From its temporary effects in this agitated state of the system, it is called the anodyne liquor. The lavender compound is another valuable stimulus to be administered under such depression of the vital powers as above, and æther may also be combined. But we must not rely upon the diffusive stimulants alone. Tonics are also to be given in this prostration of the system. Bitters, in the form of the *infusum amarum*, prepared with water, or the *tinctura amara*, (i. e. *tinct. gentianæ composita*, consisting of gentian root, orange peel, *canella alba* or cardamom. seeds,) rendered more grateful by the addition of a small quantity of the *sp. lavand.*, should now be given. This last form, with children, and in persons of a very delicate state of the stomach, is that preferred; but under other circumstances you will find the following formula to embrace all the advantages to be expected from bitters. You will recollect the propensity to fermentation in the stomach, when thus debilitated, and you will also keep in mind the necessity of regular evacuations from the bowels. The formula referred to combines all the means necessary for the purpose of controlling such fermentation when excessive, and of preserving the peristaltic motion of the intestines. The formula is as follows: quassia-wood, columbo root, aa. $\mathfrak{z}\text{ij}$.; cort. aurant. $\mathfrak{z}\text{i}$.; rhubarb root bruised, from \mathfrak{D} to $\mathfrak{z}\text{ss}$.; carbonate of potass., or soda, from \mathfrak{D} to $\mathfrak{z}\text{ss}$.; water, $\mathfrak{z}\text{xx}$.; boil to $\mathfrak{z}\text{xvi}$. and strain; and to make it more acceptable, add $\mathfrak{z}\text{ii}$. or ij . *sp. lavand.* Of this mixture, when cold, let the patient take a wine-glassful every two hours. In summer add $\mathfrak{z}\text{ij}$. of *tinct. amar.* to the mixture, to preserve it. You perceive I combine different bitters in the same prescription. It is believed by most practitioners, that the combination of two or more of the bitters is more useful than any one alone, and is more grateful to the stomach. That remark was originally made by Syden-

ham; it has since been confirmed in the practice of the experienced Fordyce; and the observation is repeated by Dr. Clarke, in his *Observations on the Diseases of Females*, p. 98. "Bitter medicines," says Dr. Fordyce, "which tend to strengthen the system, as far as my experience has gone, sit easier on the stomach, and tend more to strengthen the system, when mixed together, than when any one of them is employed singly." See paper by Fordyce, 2d vol. of the *Trans. of the Soc. for Med. and Chir. Knowledge*.

Another compound, very useful under similar circumstances, is an infusion of chamomile flowers or orange peel, and the Virginia snakeroot—an advantage in which is, that it has a considerable operation upon the surface of the body, and to which the antiseptic qualities of the snakeroot in particular are usually ascribed; ʒij. of the chamomile and snakeroot, with ʒi. of orange-peel, are sufficient to make a pint of tea—of this cold, a wine-glassful should be taken frequently. Valerian, in some cases, is a useful addition.

The Peruvian bark is also frequently had recourse to by practitioners, in typhus fever. For the most part, however, except in the more advanced state of typhus fever, it is too astringent, unless when combined with snakeroot in decoction. In this form, it may be advantageously prescribed in many stages of typhus fever, when such state is clearly marked. The bark in substance is also frequently administered; but it very frequently proves too irritating to the stomach and bowels in this form; and when it is so given, it should be controlled by five drops of laudanum being combined with each dose; but on the contrary, it may prove too astringent to the bowels. In that case, as many grains of rhubarb may be given with the bark.

External stimulants are also indicated in this state of the system. With regard to blisters, usually directed by physicians, there are various opinions. Lind, Cullen, and others, are in favour of their use; but they are objected to by others, excepting when they are applied to remove local affections attendant upon typhus fever, as of the brain, the lungs, the stomach, the bowels, or the uterus.

In affections of the brain, Sir John Pringle and others have borne testimony to their use. They are also found useful in

the typhoid stage of peripneumony, or the peripneumonia typhodes, produced by contagion. But in those diseases they should not be applied the same length of time as on other occasions; i. e. not exceeding six or eight hours, or sphacelus will frequently be the consequence in this broken state of the system. And in the irritations of the stomach attendant on yellow fever, and which frequently usher in that fatal symptom the black vomit, they have frequently been found extremely useful; and should another yellow fever be unfortunately introduced among us, blisters would be among my earliest prescriptions, to prevent that deadly symptom. They are in like manner no less beneficial in the removal of the inflammations of the intestines, attendant upon dysentery, and in counteracting the inflammation of the uterus and peritoneum, which characterize puerperal fever; both of which diseases, viz. dysentery and puerperal fever, are usually attended with fever of the typhoid character. But in all these, as well as in typhus fever, it is a very prevalent error, that the application of blisters is delayed to too late a period—applied early, they are beneficial; but they are never serviceable in the advanced state of fever, with the exceptions that have been noticed. On the contrary, they distress the patient and waste his powers. So also says Dr. Moore in his *Medical Sketches*, p. 531.*

Blisters at this period can certainly be of little use in transferring the irritation of the whole system to a particular part, (which is the object we should have in view,) for when the fluids become the seat of disease, the causes of the irritation existing are too constant, and they are too extensive to be thus controlled. And as general stimulants, others are preferable, even of those used as external stimulants, and without destroying or impairing the texture of the parts acted upon. With this view, rubefacients, sinapisms, and other stimulant applications, are had recourse to, and in my opinion with most excellent effects. Burdock leaves dipped in vinegar, sinapisms of mustard, vinegar and meal, or the toasted bread covered with vinegar and mustard. Salt herrings, garlic, onions, applied to the soles of the feet or wrists, frequently afford great

* "Notwithstanding," says Dr. Moore, "my having watched the effects of blisters with all the attention I am capable of, I cannot assert that I ever knew vesicatories of much use."

relief to the head, and sometimes counteract a ferocious delirium.

II. The system is to be excited, and its tone supported, by means of the diet and drinks of the patient, and especially by the liberal use of wine: this may be either given alone, or in the form of wine-whey, moderately strong: two or three glasses of the best Madeira to a pint of milk; or it may be given in panada, sago, salep, arrow-root, tapioca, cassava, also barley-water or caudle, rendered still more stimulant and grateful by being combined with some of the spices, as cinnamon, or nutmeg, or mace, with the addition of loaf sugar. In this form, either of these articles is rendered both grateful to the taste and acceptable to the stomach, which has its taste too on these occasions, and should be particularly consulted by the physician. Vegetable nourishments, too, you will recollect, are now to be preferred, not only as most grateful and most acceptable to the stomach, but on account of their greater antiseptic quality, and their having a less tendency to the putrescent fermentation than animal food, to which the patient, in this septic state of body, has even an aversion. But we place an equal, if not our chief dependence, upon the use of wine. The physician, therefore, should attend to its quality, as well as direct its quantity, as much mischief may be done by acid wines. As it regards strength, old wine is certainly to be preferred—we all know it is generally most agreeable.

Madeira and port wine are the preferable wines for the sick, as they are less apt to become acid, and possess more strength than claret, which is preferred by some; and among others, by Dr. Moore!! (See p. 523.) He, however, admits that he has seen the same good effect from Port, Madeira, and other wines. But if you cannot procure wine, brandy or rum diluted with water, and sweetened or made into milk-punch, may be substituted in its place. Ardent spirits are indeed more grateful to a certain class of patients than the best wines; and where they have been accustomed to the use of them in health, they are to be preferred. In this case, as well as in some nervous diseases, wine and ardent spirits are both proper, and should be retained in the *Materia Medica*, notwithstanding all the prohibitions enjoined by temperance societies.

When you first administer wine to a patient who is delirious,

give it a little warmed and sweetened, otherwise he may refuse it. For the most part, however, this is one of the few articles that men will swallow, whether delirious or in their senses—mad or sober they will drink wine.

What quantity shall be given to a patient in this delirious condition, attended with all the other symptoms denoting a confirmed state of typhus? I answer, from one to five bottles a day—observing, however, to give it most freely during the remissions in the early part of the day, and less during the exacerbations, which usually are most violent in the evenings and at night.

A case was communicated to me by Dr. Farmer, of Charleston, of a gentleman in S. Carolina, who drank eleven bottles of Madera wine in one night, and six the succeeding morning—he recovered.

Porter is another drink frequently made use of in this state and character of fever. It certainly combines many valuable qualities. It is stimulant, though less so than wine. It is tonic from its bitterness; nutritious, from the materials entering into it; and from the fixed air it contains, it is among the best antiseptics we can administer. When typhus prevailed on board the Mohawk, among one hundred passengers, I gave to the sick porter, as the chief food and physic.

Yeast, too, for the same reasons, has come into use as a powerful antiseptic and anti-emetic in typhus fever; of this a table-spoonful is given every hour. Upon the same principle with bark, spirits and wine, yeast is useful in foul ulcers, as in anthrax, exciting them to healthy action. But as both porter and yeast have a tendency to run through the bowels, where the strength is much expended, and especially if the patient be already inclined to a loose state of the belly, the purgative effects of either would render them dangerous prescriptions. On this account great caution becomes necessary. It will perhaps be a good rule, where the patient is costive, to give porter; but where the bowels show a tendency to diarrhoea to prefer wine; and if diarrhoea actually exists, give the patient spiced wine or mulled wine. And it is important to have this properly made. Have the spice, either alspice or cinnamon, boiled in a tea-cupful of water. Boil a pint of wine. Let three eggs be well beaten up with sugar. To this add your spice water, and

pour them gradually into the boiling wine. This is the very best mode of preparing mulled wine; and as you will often be asked for directions, it will be well for you to remember the form.

But upon other occasions the bowels may be so confined, that instead of these astringents to restrain a diarrhœa, you find it necessary to administer to them laxative medicine; otherwise the accumulation in the bowels will become an additional source of irritation and of vitiation to the whole system—this is a frequent occurrence. For this purpose an enema should be given once in twenty-four hours; or at most a small dose of rhubarb and magnesia; but avoid salts and active purges, especially such as operate at the expense of the whole system. Avoid Hamilton's jalap and calomel, which are too active at this stage, and too apt to disturb the stomach. His observations on purgatives in typhus I confess have astonished me! I should just as readily think of putting a lancet in a patient's arm in this advanced state of fever, as empty his vessels by the active purges he has directed. His observations on chorea are an equally exceptionable part of his work; yet his work is the work of an elegant scholar, and one of the most accomplished physicians of the age. Such I considered him at the time I knew him. I had an opportunity of witnessing his practice at the Infirmary of Edinburgh. Although it is sometimes necessary to administer cathartic medicines in this malignant form of fever, it is more frequently necessary to restrain the evacuations than to solicit them; and that too, even where the contents of the bowels are offensive. And here let me make a remark deserving your attention, that you cannot remove the putrid contents of the bowels, and that the more you purge your patient the more offensive the contents of the bowels become; for the weaker the patient the greater is the putrefactive tendency in the contents of the bowels; for the digestive process being impaired, the less is its control over that fermentative process that induces this oppressive state of the contents of the bowels, the tendency of which is to induce a diarrhœa. Anodyne medicines become necessary to correct these excessive discharges. A convenient formula for this is the following: ʒi. laudanum; ʒi. sp. lavender; ʒiij. mint or cinn. water—a table-spoonful every hour, or after every large evacuation: spirits of lavender alone is also useful.

Sir John Pringle recommends the chalk julep in these cases, to be given in conjunction with a few drops of laudanum, after every loose evacuation.

The following is a very good and agreeable formula: Gum Arabic, $\mathfrak{z}\mathfrak{i}$.; chalk, $\mathfrak{z}\mathfrak{i}$.; aq. menth. $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$.; elix. paregor. $\mathfrak{z}\mathfrak{s}\mathfrak{s}$. M. Coch. mag. post. sing. sedes. Or laudanum may be given in warm wine, mulled with cinnamon and sugar. Burnt brandy and water, with cinnamon, a flannel bandage to the bowels, and spirituous applications, occasionally renewed, will be found valuable. In some instances, this disturbance or irritation is not confined to the bowels, but involves the stomach, producing an immoderate vomiting.

The means to be employed for the purpose of restraining this, are various.

1. Riverius's mixture, with mint-water; 2. Mint-water and laudanum; 3. Soda-water, mead or spruce-beer; 4. Lime-water and milk, equal parts; 5. Milk alone; 6. Porter—alone or with lime-water; 7. Spirits or brandy and water, made strong; 8. Cayenne pepper; 9. Ice, in pills; or, 10. Give nothing. Let the stomach rest. By thus withholding drinks or medicine, the tone of the organ may be recovered.

III. A third means of improving or preserving the strength of the patient, is to prevent every unnecessary waste of his excitement: his room should be kept dark, lest the light of the day, of the fire, or of a candle, should keep him watchful. All noise should be avoided—loud speaking in his chamber especially, though it may not awake him, still disturbs his sleep, occasioning dreams. Do not suffer him, in this exhausted state, to waste his powers by getting out of bed; and in all his movements assist him. Instead of going to his night-chair, let him use a pan or a dirty sheet; and provide him with a urinal, that he may have no occasion to rise for the evacuation of his water. Even in giving him his drinks or his food, do not allow him to waste his strength by his exertions to assist himself;—support him;—and in changing his dress, the same assistance should be rendered. The same system of economizing the strength of the patient in convalescence, should also be carefully observed.

LECTURE XXIII.

TREATMENT OF THE TYPHOID STATE OF FEVER.

II. A SECOND indication in the treatment of the typhoid stage of fever, is to counteract the putrescent state of the system, which more especially appears in the fluids, though not exclusively so; for the solids, too, more or less lose their cohesion and powers of contraction.

The means of fulfilling this indication are,

1st. To continue the various excretions by the remedies which have already been mentioned, especially attending to the important function performed by the skin, inasmuch as it is the office of the function of perspiration, in health, to convey out of the body noxious, saline, and other materials. It is doubly necessary when the fluids are in a diseased condition. The accumulation from the want of this excretion must consequently be highly dangerous to the constitution, and an aggravating cause of the existing disease. Continue, therefore, the use of such remedies as act upon the surface, but at the same time employ those which are the least debilitating. Of these the *aristolochia serpentaria* is among the best. The *dorstenia contrayerva* was once much in use as a cordial sudorific, but it has given place to the Virginia snakeroot. Small doses of antimony especially, combined with a small quantity of opium, merely sufficient to prevent them from affecting the bowels, may also be administered, if the debility should not otherwise forbid the use of these medicines; but usually this is a hazardous prescription at this period of the disease, particularly without the opium. The *sp. mind.* and *laud.* is less so, but even this should be given with great caution; for it is not only the ob-

ject in view to administer sudorifics, but also at the same time to excite, and stimulate, and to preserve the tone of the system. Wine-whey is one of the best means we can direct in addition to the others which have been mentioned, to effect this object, in this state of body. It is also important to attend to the bowels—the lower intestines in particular. They should be regularly emptied, once in twenty-four hours; otherwise diarrhœa may be the effect of the irritation produced by their acrid contents, as well as by their mechanical accumulation. This is not all: by their retention, the whole state of the fluids may be rendered still more malignant by the reabsorption of the malecontents, particularly of the lower tract of the intestines. For the purpose of relieving the bowels in the typhoid state of fever, I have been much in the habit of using the following form of an enema, which I consider peculiarly calculated to correct the septic contents of the bowels, as well as to evacuate them. Vinegar, \bar{z} i. (i. e. coch. ij. mag.); yeast, \bar{z} i. to \bar{z} ij. molasses, \bar{z} i. to \bar{z} ij. (coch. i.); water, \bar{z} vij. M. To be administered cold or milk-warm.

2dly. A *second* means of fulfilling the indication now under our consideration, is frequently to cleanse the surface of the body itself, by washing it with vinegar and water, (applied at a moderate temperature; i. e. from 40° to 60° ;) three or four times a day, when the body is much heated, and the skin dry. It is necessary, however, to observe two exceptions to this rule.

1st. When the heat of the body is too low—reduced below the natural standard—and the power of generating heat is at the same time much impaired.

2d. Another exception to the use of cool, or cold applications, is the presence of local diseases, conjoined with this typhoid state of body, as in dysentery, peripneumony, puerperal fever. In those cases, cold applications are injurious—tepid washings with vinegar and water, or with spirits and water, should then be employed.* And it is to be remarked, that tepid water, applied to the body, conveys off the caloric as well as the cold affusion, and partly in consequence of more speed of evaporation.

* By tepid water is meant warm, not hot water—not hot to the sensations—say from 87° to 97° of the scale of Fah.

Dr. Currie also observes, that he has made use of tepid water with advantage in many of those cases where the oppression might be dangerously augmented by the sudden stimulus of the cold affusion; but its effects he considers to be not so permanent as the cold; still he admits it to be as useful in diminishing the heat, but not as a stimulus to rouse the system at the same time into a violent reaction.

3dly. If the heat of the body is much reduced, and the body itself exhibits a livid appearance—if the extremities are cold, and the powers are greatly exhausted by which the heat should be restored, in that case let the body be frequently sponged with warm or hot spirits, and afterwards diligently rubbed with a coarse towel or with flannel. Make use of a bath rendered stimulant by its temperature, and still more so by the addition of spirits, Peruvian bark, and the aq. ammon. occasionally, adding the last article while the patient remains in the bath.

4thly. Be careful to remove all excrementitious discharges from the apartments of the sick; with the same view, too, frequently change the bed, the bedding and the dress of the patient; (for this purpose let a cot and bed be introduced into the room to lay the patient upon, that his strength may not be wasted by setting him up in a chair.) It will also be well to make use of flannel shirts instead of linen; for flannel not only preserves a uniform temperature about the body, but it also excites the skin to more vigorous action; and it absorbs the offensive and noxious materials discharged from the surface in this state of disease; and it is by many physicians believed that the vinegar shirt, as it is called—that is, a flannel shirt, after it is washed, being dipped in vinegar and dried, is preferable to flannel without this process. I have seen it used so often, with benefit to the patient in this disease, that I really believe it has advantages from the acid even thus applied. The vinegar, too, may render the flannel more stimulant to the surface, and like the vinegar and other acids acting upon the air, it may in this way perhaps have some good effect by decomposing the noxious materials as they are discharged from the surface of the body. But whatever opinion we form upon this subject, we doubtless must all unite as to the benefits at least of frequent changes of dress, and the preference to be given to flannel over linen, inasmuch as it is more stimulant to the surface, and bet-

ter calculated to absorb the discharges from the skin, and to preserve a uniform temperature about the body of the patient.

5thly. Preserve the air of the room as pure as possible, by ventilation; for, as Dr. Fordyce observes in a letter which I received from that learned and distinguished physician, a short time before his death, "dilution with atmospheric air is the great means of destroying contagion, not only as it regards the individual, but his attendants and friends." This should be inscribed over every door of the wards of a fever hospital, and no less strictly observed in the private apartments of the sick. With the same view attend to the size of the room in which the patient lies sick—put him in the largest room of the house—attend also to its temperature. Be careful, however, not to let the bed be too cool at this advanced period of his disease. And should his heat be too low, the addition of more clothing may become necessary; but too hot an atmosphere is more to be apprehended; for in our climate, at least, this disease is most prevalent in the hottest seasons of the year. So also in the southern states, and in hot climates. In a hot climate, and in the hot seasons of the year of temperate climates, cool the air by frequently sprinkling the floor for the benefits of evaporation. And that you may purify the air at the same time that you cool it, sprinkle it with vinegar; and if the air be very impure, as in hospitals, or in courts or prisons, make use of the acid gases in general, as they have been lately recommended by Guyton de Morveau and Carmichael Smyth, for the purpose of disinfecting the atmosphere. You will find that the fact was known to Sir John Pringle, as early as 1750, that the mineral acids will destroy contagion. Johnstone of Worcester, in 1758, made use of it for this purpose. Guyton de Morveau and Carmichael Smyth, at Winchester, have the merit of bringing them again into use, and have received the grateful acknowledgments of the world for this truly important service. They certainly are entitled to thanks for what they have done. Nevertheless they cannot justly have ascribed to them the merit of originality. Dr. John Johnstone of Birmingham, in his "Account of the discovery of the power of the mineral acids in a state of gas to destroy contagion," published in 1803; and in his "Reply to Dr. J. C. Smyth" in 1805, has triumphantly shown that the disinfecting property of the

acid gases was known and employed by his father in 1758. And if you will read a paper, entitled "An attempt to show that the use of Acid Fumigations was known before the time of Morveau, Smyth, &c." published in the American Medical Recorder, (vol. iv. p. 133,) by its then editor, Dr. Ducachet, you will see that it was well known to Boerhaave and his commentator Van Swieten, half a century before Dr. Smyth laid claim to the discovery; and that the celebrated Dr. Mead, who lived at the same time, understood it well. In his six hundred and fifth Aphorism, Boerhaave speaks largely of the virtue of *acid fumes*; and in his *Elementa Chimiæ*, tom. ii. p. 269, expressly says, "*totus acidus vapor totum aera emendat.*" His annotator, too, was evidently perfectly acquainted with the disinfecting power of acid vapours. Indeed you will find it clearly demonstrated in that paper, that it was not unknown even in ancient days. Dr. Ducachet shows conclusively, that it was known to Homer, since the bard represents Achilles as resorting to the use of sulphurous fumes to purify a vessel, in which he intended to offer a libation to the gods for the success of his friend Patroclus; and as he tells how Ulysses, on his return to Ithaca, fumigated his house with sulphur, to free it of its pollution by the blood of certain troublesome visitors who had been slain there.

"With fire and sulphur, cure of noxious fumes,
He purged the walls and blood polluted rooms."

ODYSSEY, book xxii. lin. 529.

Indeed, the existence of the verb *ῥεσίζω*, in the Greek language, which signifies to *purify with sulphur, sulphure lustro*, shows that the value of acid fumigations by means of volatilized sulphur—in other words, by the sulphurous acid, was known familiarly to the Greeks. But I must refer you to the dissertation itself.

The following are the compounds which are employed for the purpose of supplying these two gases, viz., the nitrous acid gas of Smyth, and the oxygenated muriatic acid gas of Guyton de Morveau. The first is prepared as follows:

Take of the nitrate of potash pulverized, ʒss.; put it into a saucer; pour upon it the same quantity of the sulphuric acid:

by exposing it to heat upon a chafingdish, the decomposition will be facilitated ; the sulphuric acid generated is immediately extricated and diffused through the apartment.

The oxygenated muriatic acid gas, the chlorine gas, as now called, is prepared in the following manner :

Common salt, ℥iv. ; oxyde of manganese, ℥i. ; sulphuric acid, ℥ij. , diluted with water, ℥ij. ; put over a chafingdish of coals. See Proceedings of the Board of Health of Manchester, p. 42. But the Professor of Chemistry will give you every detail upon this subject.

As I before explained to you, the mode in which these gases operate in disinfecting the air, and in destroying the odour of putrid materials, is supposed by Crawford and by Dr. Garnett to be by combining with the hydrogen gas, which is believed to hold these noxious matters in solution, or at least which holds a very close and intimate connexion with them. The air, it is known, is rendered instantly pure. The effluvium which arises from the decomposition of animal and vegetable matter, and which so sensibly affects our smell, has been ascertained to consist either of sulphur, phosphorus, or ammonia, or these combined, and held in solution by union with hydrogen. None of these combinations are offensive when uncombined. Hence, then, it is our object to separate them. This is effectually accomplished by these acid gases. The oxygen they contain combines with the hydrogen, and the material or materials held in solution or in combination are precipitated, and consequently rendered harmless. And that these gases are no less useful in destroying the matter of contagion, has been most abundantly established.

6thly. Tonic medicines furnish another means of counteracting the putrescence of the system. With this view the bitters already noticed, both in their watery and spirituous forms, viz. the infusion of columbo and quassia, or of chamomile and orange-peel, or in the form of the tinctura amara, may still be continued, as among the best means of giving tone to the stomach and other organs concerned in the digestion and assimilation of our food, at the same time that they lessen the morbid sensibility of the whole system. The addition of the mineral acids is no less beneficial in this septic state of the system. Not only as tonics, but by their chemical agency, they may

also be useful in their action on the system—at least upon the contents of the intestinal canal, in which the putrefactive fermentation predominates while the digestive process remains impaired. Bark, in its various forms of substance, infusion, decoction or tincture, and especially in combination with snake-root or the sulphate of quinine, should also be given in this stage of fever—in a hot climate particularly, it is indispensably necessary; so much so, that the practitioners of the West Indies introduce it in every possible manner, by the stomach, by the skin, and by injection, and frequently all combined. And so tenacious are they on this point, that when administered by injection, if it should be rejected by the irritable bowel, and laudanum is not sufficient to cause it to be retained, they have recourse to mechanical pressure upon the intestine to secure its retention. It is a common practice, I am told, for Mingo to sit by the half hour with his compress, plugging up the anus, after a dose of bark has been thrown up.

“When a dangerous debility, and a train of malignant symptoms are threatened,” says Dr. Moore, (*Med. Sketches*, p. 507,) “the bark is found the most powerful means of preventing those symptoms; and notwithstanding its astringent qualities, frequently promotes a salutary diaphoresis more effectually than any of the medicines which enjoy, from prescription, the title of diaphoretics.” He adds, “When the patient is out of danger, you may account for this in the best manner you can, and settle the point at leisure. Whether in producing these effects it has acted in the character of a tonic, diaphoretic, or antiseptic—the nature of the disease being ascertained, and the alimentary canal entirely cleansed, the bark should be given without waiting for very distinct remissions. To wait for such when the disease appears to be the nervous malignant fever, is to wait for what will not happen—depriving the patient of a probable chance of recovery, and allowing him to incur the risk of sinking suddenly into such a state of weakness as will render the bark, and all other medicines, of no avail.” *Medical Sketches*, p. 507–9.

7thly. Vegetable nourishments are at this time peculiarly indicated; and animal food, even in the form of soups, should be rigidly avoided. Very fortunately, however, nature herself rejects them as offensive—even their smell is disagreeable to

the patient in this state of body. On the other hand, the appetite for acids is strong and eager. Fresh fruits, as strawberries, grapes, oranges, limes, lemons, in their season; or roasted apples, currant-jelly, cranberries, when fresh fruit cannot be obtained, will also prove a very grateful and valuable addition to the nourishments of the sick—but like the yeast and porter, they must be given with great caution, lest they prove too purgative in their effects. But while you can command the juice of the grape, you need be at no loss for a very effectual means of preserving the tone of your patient. This, at least, is my sheet-anchor on these occasions. Attend, too, to the time and manner of administering food, as well as the quantity given. Food, in many cases, should be given every half hour. In cases of stupor, arising either from an accumulation of blood, or of serum upon the brain, or from an exhausted state of the sensorial power, or where there is a great propensity to sleep without such apoplectic pressure, the patient, in that case, must be roused frequently to take his nourishments or his drinks.

Insensibility takes place to such a degree sometimes, that the patient takes the food or his medicine into his mouth, and retains it there without swallowing it: in that case, excite him by loud speaking, and actually commanding, in a loud tone of voice, directing him to swallow it. Present another spoonful, and another—he then swallows. This degree of insensibility is a very unfavourable symptom. In this critical situation of your patient, food or medicine should be given in small quantities, but frequently. Recollect that in large quantities you produce great irritation—vomiting, purging, oppression, restlessness; a renewal or increase of fever are oftentimes the consequences of such excess. Remember, however, to continue the use of wine or porter, preferring one or the other as circumstances may point out. But suppose the stomach rejects nourishment or medicine, or both; in that case make use of enemata for conveying both medicine and diet.

We told you of the skin as an important medium of communication, a sort of second stomach; the lower bowels may be considered as a third stomach, and prove a valuable resource on many occasions. Milk punch, arrow root, starch or sago, in wine-whey, may thus be administered as well as medicines. Another observation deserving your attention is, that

in this extreme prostration of the system, the patient is frequently unconscious of many of his sufferings, and only signifies them by his moanings, but without intelligence sufficient to refer them to the particular part which may be affected. Of this he is indeed himself insensible. In some instances it may arise from an accumulation of fæces; an enema will in such cases afford him relief; or it may proceed from a collection of urine in the bladder, which the patient should be urged to evacuate. In case of inability to do so, the catheter should be employed. The irritation of a blister which requires dressing, soreness of the mouth or throat from the use of mercury, or from aphthæ, not unfrequently the attendant upon the last stage of fever, may be the source of the patient's distress. In the latter case, yeast with honey and borax, are among the best applications, either in the form of a gargle, or a wash, if the patient has not strength to gargle his throat. It is proper for me to state to you, that Dr. Bard in such cases is fond of small doses of mercury, i. gr. two or three times a day—perhaps the very excitement produced by mercury may be useful in doses of this sort. Soreness from long lying in bed, and from the pressure of particular parts, in consequence of remaining long in the same position, will not only occasion pain, but in some cases active inflammation and sphacelus, depending upon the condition of body, are the consequences, and require the prescriptions of the physician. In this debilitated and vitiated state of the body, the most stimulant dressing and applications become necessary; such as cloths wet with yeast; lint moistened with the pyroligneous acid; the yeast poultice, or a dressing of the basilicon ointment, may be useful, preserving the parts very clean by repeatedly washing them with hot water, with the addition of a proportion of rum or brandy. To all these varied sources of suffering, the attention both of the physician and the nurse should be given in the sick room.

The symptoms of recovery and convalescence next fall under our consideration. How is the patient known to be convalescent? This may be known—first, by attention to his vital functions. The pulse is calm, more full, soft, and generally slower than natural, and more regular, excepting in yellow fever. But quickness frequently remains sometime in convales-

cence from fever. The respiration is more regular, but also, like the pulse, slow, and sometimes attended with sighing.

Secondly. The natural functions manifest a change which indicates a solution of fever, and the commencement of recovery. The tongue and lips show the returning secretions; they now become moist, and the tongue clean, especially at its edges; it is also of its natural colour, losing the crimson or brown hue. The fur upon the middle of the tongue too, appears more loose, and easily to be detached. The teeth, gums and lips appear cleaner, and freed from the sordes that were observed upon them during the continuance of fever. The skin likewise shows a returning natural temperature, with a general moisture upon its surface. Indeed, the vessels upon the surface sometimes become so patulous, that there is a great propensity to a profuse discharge by sweat, especially during sleep. This, however, for the most part, is a favourable symptom, and shows a more complete solution of the fever, than almost any other single symptom, except when that sweat is attended with coldness of the extremities.

The kidneys too, manifest the change induced in their secretion. The urine deposits a large sediment, and is frequently discharged in greater quantities. The appetite returns, not only for food, but even the artificial one for snuff, coffee, and other accustomed stimuli. The bowels too, become more regular; the stools take place spontaneously; they assume their natural colour; they are less fluid, the thinner parts of the contents of the bowels being taken up by the returning healthy action of the absorbents. They also acquire more consistency, assuming a "figured shape," as Dr. Home denominated it. Not unfrequently, too, this returning tone of the intestinal canal is manifested by an occasional discharge of wind, and that too accompanied with a loud report. This circumstance shows not only the contractile state of the sphincters, but that the bowels are now sensible of their contents; that they can now make distinctions; whereas, before they did not distinguish what was passing, but let all go indiscriminately.

On this subject let me tell you a little anecdote, which I had from Dr. Rush. The Doctor had a patient extremely ill, in the Pennsylvania Hospital, and for whose recovery he experienced great anxiety. He left him very low, not expecting his recovery.

The old nurse of the house was no less attentive to his situation; her anxiety kept pace with the Doctor's. She watched the patient very narrowly; nothing escaped that she did not know. In a short time a change was effected. In a little time, down came old Molly, the nurse, who felt as much anxiety on these occasions as the Doctor himself. The old lady impatiently asked for the Doctor.—“Well, Doctor, our patient is out of danger!” “Ah! indeed! how do you know, Molly?” “Ah!” says she, “I have one sign, Doctor, that never, never deceives me.” “Well, tell me nurse, what is that?” “Oh! you must excuse me, Doctor, but I know he is a great deal better.” “I must know that secret, nurse.” The Doctor was determined to sift Molly to the bottom. “Well, saving your presence, Sir, if I must tell you, he just this moment let go a most terrible ——.” When you get this signal, this “*signum salutis*,” you will remember that your patient is in a good way.

In some instances the patient, in convalescence from fevers, has a great propensity to sleep, and which to the family or friends is a source of some uneasiness. This circumstance is favourable to the recovery of his strength, as it prevents that waste of excitement which otherwise takes place. Though it be excessive, I still call it natural sleep; that is, when the other symptoms are favourable which have been enumerated. Be careful, however, to distinguish between this propensity which is so common in the advanced state of fever, from stupor or coma. This will readily be done, by examining the iris and its power of contracting; attentively observing the other functions of the system, such as the state of his pulse, and his breathing, which are natural. His natural functions too, as well as the vital, go on very regularly, and when he is awakened, it is done with ease, without much exertion of his attendants, and he awakes composed. It will also be necessary to rouse the patient frequently, even from this natural sleep, to give him the necessary medicine and nourishment. Be particular too, to change his position in bed frequently. By this means you relieve one set of muscles while you exercise another. This leads us to notice the treatment proper to be employed during convalescence.

1. Of *medicines*.

Tonics are now manifestly necessary, for the purpose of aid-

ing the digestive and assimilating process, and thereby to correct that tendency to fermentation which still exists, and indeed which predominates, while the tone of the stomach and of the whole system remains impaired. With this view, I usually direct the bitter infusion—either the simple, viz. composed of gentian $\mathfrak{zss.}$, orange-peel $\mathfrak{zij.}$, water $\mathfrak{zxx.}$, boiled to $\mathfrak{zxvi.}$, or the more compound one mentioned before, with a combination of rhubarb and the carbonate of soda, or in the form of tincture. If the debility is excessive, and is attended with profuse sweating, I generally direct the elixir of vitriol to be taken in combination with the bitters; about xv. or xx. drops four times a day, but not with the rhubarb and soda, these now should be omitted. Some recommend the muriatic acid in doses of gtt. x. or xij., to be given in each dose of the bitter infusion, or of the tinctura amara, every three or four hours; and if they prove purgative, five drops of laudanum are combined with each dose. In the practice of physic of Dr. Wm. Fordyce, you will see this acid particularly recommended in malignant fevers, and as a gargle in the sloughs and ulcers of cynanche maligna.

Not long since a reward was bestowed by the king of Prussia upon Professor Reich, of the University of Erling, in Franconia, for the disclosure of his secret, which proved to be no more nor less than the muriatic acid. Can it have effect in this state of body in guarding against those combinations in the bowels, and in the circulating fluids of the system, which take place in a typhoid state of body? or of breaking up those combinations when they are already formed? If these acids are useful in decomposing fluids out of the body, assuredly they may be equally salutary in decomposing morbid compounds within the body.

Be no less attentive, at this time, to the condition of the intestines; and for this purpose, occasionally administer an enema, or a small quantity of rhubarb or of magnesia, particularly of calcined magnesia, which is freed from its fixed air. In this respect it is preferable to the carbonate, which contains seven-twelfths of fixed air. Or a single pill composed of a grain of gamboge and of aloes may be administered; or the addition of the elixir proprietatis to the tinctura amara, say of the former $\mathfrak{3i.}$, to $\mathfrak{3ij.}$ of the latter.

2d. The *food* of the patient should also still fall under the

physician's special direction, during the period of convalescence—his food should be of easy digestion. Accordingly, too, as the vitiation of his system may have been induced, and as it may still continue, let him in that case employ a large proportion of vegetable nutriment—I mean of those articles abounding in mucilage, as the arrow-root, rice, tapioca, sago, salep, with a due quantity of wine or brandy and aromatics; at the same time allowing him the moderate use of the fresh fruits of the season. Let him return gradually to the use of animal diet, and then, as before observed, let it consist either of game, such as quail, pheasant, and other wild fowl, or venison; or a roasted oyster may be given—not raw. The old meats, too, such as beef or mutton, are preferable to chickens, lamb, or veal—roasted and broiled are also preferable to boiled, as they contain more of the nutritious juices of the meat; and they should be taken in this state of the meat, well seasoned with the usual condiments of the table, pepper, salt, and mustard. Avoid pork, or meats dressed with much oil or butter—they are not only in themselves oftentimes offensive to the delicate stomach, but being difficult of digestion, they readily become the means of occasioning some derangement of the digestive organs, and of renewing the febrile irritation. His food should be taken frequently, but in small quantities. Let him eat four or six times a day, but moderately at each time. The neglect of this rule has led practitioners to disapprove of the use of animal food, especially taken in a solid form, during convalescence; but under this restraint it may be taken with safety, and indeed is more easy of digestion than most other nutriment. His drinks should be Madeira wine and water, porter, spirits or brandy and water. Let him avoid table beer, cider, and lemonade; they are too acid and acescent, and consequently debilitating. Tea and coffee, too, should not now be employed; they take the place of more substantial, more stimulant, and more nutritious articles of diet. Chocolate is more nutritious, and on this account more proper; but it should be carefully prepared, and freed from the grease and oil which enter into it, and which are frequently blended with it by the manufacturers of that article of diet.

3d. The *exercise* of the patient, the proper time of taking it, the kind of exercise, and the degree of it, should be directed by

the physician. As soon as the patient can take exercise without fatigue, he should go out into the open air; this stimulus is no less necessary than useful. Riding in an easy carriage is the best mode of exercise while he remains debilitated; but it should be so moderate that he can return without fatigue; otherwise it will do him more injury than benefit. He should be careful, too, to avoid excess of bodily exercise, even in his chamber. The very exertion of dressing, writing, or of shaving himself, should all be done with great caution at this time. Mental exercise also should be guarded against, as in conversation, reading, attention to business, company, &c. Excesses in any of these occupations readily induce a relapse, while the body remains in this irritable state. Remember the brain is a gland; therefore, economise its excretions, whether in thought, word, or deed—whether in mental or in bodily exercise; for the least indiscretion or excess in these respects has been known to induce a return of fever, and which is always more formidable in its symptoms and in its consequences than the original attack. The sequelæ of fever, the consequences of it to the body and mind, merit your attention.

1st. The most usual of these, after a long-continued fever, that the physician is called upon to prescribe for, is a swelling of the legs and ankles; but in some cases an accumulation of fluids in various cavities of the body, producing hydrothorax and ascites, is thus induced. A temporary anasarca, thus induced by loss of tone in the absorbents, and debility of the heart and arteries, and nervous system, is of very frequent occurrence after fever. An occasional and very mild cathartic may be administered, if the bowels be not in a regular state; this should be succeeded by the use of iron and bitters. There are different modes of exhibiting the iron; it may be given in rust; taken mixed in syrup of ginger, gr. x. three times a day. Others prefer the filings of iron made up into pills, with the extract of gentian, two pills of gr. v. each, to be taken three times a day. Chalybeate wine is another form of administering this powerful tonic; ℥ss. of the filings should be infused in a bottle of old hock; after standing a few days in a proper temperature, occasionally shaking it in that time, half a wine-glassful should be taken three or four times a day. This is one of the most effectual, and one of the most agreeable modes of taking

iron, to those who like a glass of hock. In some instances I have administered with good effect an electuary composed of bark, iron, and cloves, in the proportion of ʒij. bark, ʒij. iron filings, 60 cloves, q. s. syrup; a tea-spoonful of this may be taken alone or mixed in a glass of Port or Madeira wine, three or four times a day. The tincture of gentian, called also *tinctura amara*, or the bitter infusion, may also be occasionally continued. A flannel roller applied to the legs and ankles—friction with a flesh-brush, and bathing the limbs with brandy or rum, or these all combined, are among the best local applications which can be employed. Blisters, applied to the inside of the ankles, I have also made use of with benefit, in cases of this nature, where the swelling of the limbs remained more than ordinarily tedious. A Mr. C. from the West Indies, in 1795, was a remarkable instance of this kind. He was pale, and his whole cellular membrane loaded with water. Blisters and the chalybeate electuary, with aloes, with the free use of gin toddy and other stimulant diuretic drinks, were his remedies. In his case the stimulant effects of blisters upon the sluggish absorbents and circulating vessels were obviously beneficial. But much also may be done by attention to diet and exercise. Not only animal food, but the free use of condiments, should now be recommended in this state of body—mustard, horse-radish, and Cayenne pepper, should be taken freely. The following stimulant and diuretic drink may now be taken with peculiar advantage: it is composed of horse-radish, mustard seed, parsley roots, of each a handful—these are infused in a gallon of hard cider—not acid cider. This infusion is to be made in an iron pot, or if in an earthen one, add an ounce of iron filings or rusty nails; let it stand near the fire, where it can have the benefit of a moderate degree of heat—to be strained after standing two or three days and bottled; a wine-glassful three or four times a day. Gin and water, or an infusion of juniper berries, may occasionally be substituted.

This species of dropsy, however, is not to be treated in the manner recommended by Dr. Moore in his *Medical Sketches*, viz, by jalap, nitre, and other depleting remedies; for such accumulation of fluid in the cellular membrane is not referrible to increased effusion, but to loss of power in the absorbent vessels, and diminished action of the extreme arteries, and conse-

quently retarded circulation in the veins—not the increased action of the exhalents, proceeding from an increased excitement and plethoric state of the arterial system. Dr. Moore does not appear to have been apprised of this important distinction, and which is especially important as it regards practice.

2d. Glandular swellings, ending sometimes in inflammation and abscess, are among the consequences of long-continued fevers, especially in hot climates and the southern states. These originate in debility of the small circulating and absorbent vessels, producing congestion in the glands—for glands are made up of a congeries of small vessels, which in such debilitated habits of body are apt to become affected. These congestions sometimes appear in the glands of the neck—of the axilla—in the groins—but more frequently in the liver and the spleen. Tonics, especially the mineral tonics, are among the most effectual means of removing such obstruction; but if inflammation be induced and suppuration be the consequence, they should be opened as early as possible, to prevent or to remove hectic fever, and followed by the free use of the Peruvian bark, the nitric acid,* and other tonics; at the same time that stimulant dressings should be made use of, to excite the healthy action of the vessels of the part affected.

3d. Biles are in some instances the consequences of fever, and the vitiated state of the system. These are only to be counteracted by improving the digestive process, (not upon the principle that all diseases originate in the stomach, as is maintained by many writers, particularly Broussais of France, a late innovator and reviver of the Brunonian doctrines,) but by enabling the organs concerned in that process to furnish the blood with a healthy chyle, at the same time that the tone of the other functions is restored by a stimulant and nutritious diet. It is also a good rule in this case to discharge the contents of such imposthumation as soon as possible.

4th. The mind as well as the body remains debilitated, and manifests this debility in all its faculties—in a deranged condition of the internal senses, in a loss of the memory, a diseased state

* The manner of giving it is thus: nit. acid ℥i., water ℥ij., sweetened; a wine-glassful every two hours; the acid is to be gradually increased to ℥ij. to a quart; not that the nitrous acid has any specific operation upon the liver, as many have supposed.

of the imagination, and an enfeebled condition of the understanding. Such was the situation of a reverend gentleman under my care. That gentleman is naturally of a very sensitive nervous system—a man of fine taste, distinguished both for his capacity and his acquirements. After a tedious remittent, and typhoid fever supervening, all these morbid effects remained in the mind when his bodily functions had become comparatively restored. Such was the critical state of his imagination, that he had very nearly been led to commit an act of violence upon himself. But by time, by the use of tonics, and a journey, he has fully recovered both his mental and his bodily powers. In such cases in general, recovery may be predicted from the prudent use of the means that have been pointed out. In the communication to the physician (Dr Bard) by whom I was consulted in the case referred to, I expressed this prognosis with great confidence. This hypochondriacal state of mind is especially to be counteracted by exercise, in which the mind is to be gratified at the same time—as by a journey through a variegated pleasant country, and particularly when attended by a cheerful and intelligent companion. A return, too, to ordinary business, when the strength will permit it to be done, is also among the most important means of restoring the mind to the healthy exercise of its functions.

These observations finish our view of general fever. I hope it has not appeared tedious to you; if it has, my sense of its importance must be my apology. We shall next proceed to call your attention to the different forms or types of fever, and to point out their discriminating characters.

LECTURE XXIV.

DIVISIONS AND CHARACTERISTICS OF FEVERS.

WE have seen fever as consisting in an irritation of the whole system; as affecting the brain and nervous system; as showing itself in the moving fibres; as deranging all the functions both of the body and mind, and at last affecting the fluids; and these again reacting upon the system, producing secondary or typhus fever. The general symptoms of fever have been described; its various causes have also been pointed out, whether predisposing, exciting, or proximate, with the manner of their operation, as far as facts have enabled us to trace the connexion between causes and their effects; a subject always involved in obscurity, but peculiarly so as it regards the phenomena of the animal economy in a state of disease. The general treatment of fever has also been laid before you, corresponding with the various forms and stages which fever assumes, whether consisting in a state of simple excitement, or that which involves a morbid state of the fluids, which we have denominated the complicated excitement of the system.

We shall now proceed to notice the *various forms of fever*, and to enumerate the *characteristic symptoms* of each. A preliminary explanation of two or three terms becomes necessary on this subject. When speaking of particular fevers we make use of the term *paroxysm*, by which we mean that period of the disease in which the fever is present, as opposed to apyrexia or intermission, when fever is absent.

We also use the term *remission*, to denote merely a sensible abatement of fever, as opposed to the increase of fever called exacerbation.

Crisis is another term much employed when speaking of fever and other acute diseases, and denotes the tendency to a

perfect termination or solution of the fever, meaning more especially continued fevers; but does not apply like apyrexia or intermission to the conclusion of a single paroxysm. This name *crisis* is derived from the Greek word *κρίσις*, to pass through. It therefore also has a reference to the discharges from the system of a supposed morbid matter, or something noxious, which had been the cause of fever, or may have been engendered in the system as the effect of the fever. These salutary discharges, so terminating the disease, whether by hemorrhage, by vomiting, by urine, by stool, by sweat, or by eruptions, or by creating a new local inflammation, were accordingly called critical discharges, critical eruptions, &c. In some instances, indeed in most cases, these events are favourable, producing a complete solution of the fever; but in others, they produce a contrary effect, and not only fail to remove the disease, but are followed by an exacerbation or aggravation of all the symptoms of fever. Crisis, accordingly, is sometimes considered as favourable; and, under other circumstances, unfavourable—perfect and imperfect.

A judgment must then be formed from the circumstances attendant upon such inordinate changes which occur in the progress of a disease; hence some have derived the term crisis from *κρίνω*, to judge, because a favourable or unfavourable prognosis or judgment of the event is now to be formed, dependent upon the discharges or symptoms which are now presented. The *days*, too, when such changes occur, are hence called *critical days*, and from the last mentioned etymology they are also called *judicial days*. Those days on which such occurrences take place, and on which diseases are particularly apt to terminate, received great attention from Hippocrates, Galen, and other ancient physicians; but at that time, when diseases were less under the control of human reason than they are at present—when nature, not art, directed the progress of diseases, those changes were deemed of more importance in making up a prognosis of the event, whether favourable or otherwise, than they are at this day. Still, though these violent changes are of less frequent occurrence at the present time, the study of them is important with the view to the prognosis.

The days which Hippocrates has pointed out as those on which fevers are most apt to terminate, or when changes most

frequently occur, are the 3d, 5th, 7th, 9th, 11th, in those cases in which the tertian type of fevers appears to show a prevailing influence; and on the 14th, 17th, and 20th, in those in which it assumes the quartan character. Even among the ancients, the correctness of this view of the tendency of fevers to terminate on particular days was called in question. Herophilus denied it in toto. Asclepiades considered the whole doctrine of critical days as idle and nugatory. Celsus even derides it as not only grossly inconsistent with itself, but as originating in the cupidity of physicians, who for the sake of gain were desirous of protracting their attendance, and multiplying the number of their visits.* Langius observes, "If a crisis is to be expected, medicine is superfluous."

Some again have imagined that Hippocrates, in his adoption of this doctrine, has been influenced by the harmony of numbers, according to the Pythagorean philosophy. In that case the irregularity in the changes noticed by Hippocrates would not have been admitted, and which Celsus considered as constituting their inconsistency. Van Swieten very properly urges this fact as an evidence of the correctness of Hippocrates, and that he has made a faithful record of what he saw in that climate. Some, too, suppose the works bearing the name of Hippocrates to be written by different hands, and that the doctrine of critical days, with some other doctrines, were not written by the sage. But Dr. Rotheram very properly contends, from the uniform style, and the same provincial dialect running through those writings, that they are all the production of the same hand.

Among the moderns this subject has received comparatively little attention from the practitioner; for diseases have undergone so much change in their character by climate, by mode of life, and especially by the more active treatment that is now pursued, compared with that of former days, that they are necessarily more irregular in their terminations: whereas, in the earlier ages, diseases were seldom interrupted in their progress by medicine, and the means employed were comparatively inefficient. Still, however, this tendency in fevers to such critical terminations on particular days, is doubtless to a certain extent

* See lib. iii. cap. 4.

well founded, and merits attention. We have further evidence of the correctness of the observations of Hippocrates, as they were made in Greece and Asia Minor, that the same have since been confirmed by Cleghorn on the shores of the Mediterranean, by Balfour in the East Indies, by Jackson in the West Indies, and other writers on the fevers of hot climates. As far as they have been attended to in northern latitudes, and in temperate climates, they have also been verified. The experience of Dr. Cullen, Dr. Fordyce, and of Dr. Willan, also concur in the support of this doctrine. The periodical movements which take place in the human constitution are no less favourable to this explanation. If habit governs our appetites, our excretions, our hours of sleep, the return of diseases, &c., we ought not to be surprised at the tendency to the termination of diseases at certain definite periods. The observing physician will at least keep them in view, and as far as possible render them subservient to his purposes, not only in predicting the event of a disease, but in directing his prescriptions to promote a favourable termination, or to counteract any unfavourable result that may be expected.

Fevers have been variously divided, FIRST, according to the extent to which they spread, as,

1st. *Epidemic*, i. e. when diffused through a country—as influenza, dysentery, scarlatina, cynanche maligna; that is, as connected with a general condition of atmosphere.

2d. *Endemic*, circumscribed within certain limits, independently of any *general* condition of atmosphere.

SECONDLY. Fevers have been divided according to their causes, as into marsh fevers, contagious fevers.

THIRDLY. According to their character, as it regards their symptoms, whether inflammatory, bilious, nervous, putrid or malignant.

And, again, they are divided according to the distinctness of their paroxysms, into intermittents, remittents, and continued. These are the least ambiguous denominations; whereas the distinctions of putrid or malignant cannot be appropriated to any particular form of fever.

In the nosological arrangement we have adopted, you will find that we divide fevers into, 1st. *Intermittents*—that is, such as recur at regular periods, but which also have as regular periods

of intermission, or perfect apyrexia or total absence of fever. 2d. *Remittents*, in which there is a sensible abatement, and which return with great regularity, but not amounting to a perfect apyrexia or intermission. 3. *Continued* fevers, which have no intermission, nor a regular remission, and are frequently without even an evident abatement for many days together, as typhus, yellow fever, plague, dysentery, &c.

This distinction, you will perceive, is not admitted by Dr. Cullen. On the contrary, intermittent and remittent fevers are considered by him as one and the same, because they frequently run into each other. The same union has been made by Wilson; but we might with the same propriety include continued fevers under the head of intermittents, for intermittents not unfrequently end in remittents, and then proceed even to typhus or the continued form.

Dr. Cullen remarks, (see note in his Nosology, vol. ii. p. 45,) that intermittents and remittents arise from marsh effluvia; that they both appear in the same places or situations, and at the same season of the year; that they are equally epidemic, and that they are cured by the same means; that they change type in the same person; and he adds, that for these reasons they should not be in different orders, nor even in different sections; but that they should both be included in the same section, as modifications of the same disease!! Even if all his premises were true, while the two diseases differ in their characters they should hold a different place in a well-formed nosological arrangement; otherwise, let us abandon all nosological distinctions. The same reasons, as far as they do apply to intermittents and remittents, might be extended to continued fevers, and remittent and continued be made one, as they were by Vogel. The typhus fever, as it appeared at the Walkill, commenced as an intermittent, then become remittent, and at length ended in typhus. The same thing has been frequently observed of the Lake fevers. They commence for the most part in an intermittent form, but by their duration they become remittent, and at length terminate in typhus. They are not originally of the continued form, much less do they assume in any stage the character of yellow fever, as stated by certain late writers. The malignant Walcheren fever, as described by Davis, also frequently commenced under the guise of an inter-

mittent. Still, such is the difference of the character in the progress and termination of the two diseases, that they should be kept separate.

But Dr. Cullen is not correct in his premises. They do not all arise from marsh miasma; he should have qualified his definition with a *plerumque* "miasmate paludum ortæ." Even intermittents, as I have already observed, do not always arise from miasma, but from cold, moisture, debility, and other causes. Relapses are especially induced by debility as the predisposing cause. Galen observes, that acid drinks will bring back intermittents. Debilitating medicines will, in like manner, renew an intermittent. A case occurred to me some time since, in which venesection, mercury, and other means directed for the cure of hepatitis, brought back an intermittent. Tartar emetic, given for the cure of croup, to a child who a short time before was cured of an intermittent, reproduced that disease. I have related to you another case in which mental distress revived the paroxysms of an intermittent. Inflammatory complaints, it is well known, frequently terminate in intermitting fever; every practitioner must have witnessed this fact. Besides, as I have already observed to you, intermittents have been met with in the city of New York at all seasons of the year. They cannot therefore be considered as exclusively arising from marsh miasma. Remittents in like manner are frequently generated in the system, without marsh miasma as their cause; and frequently, too, they run into the continued form, becoming typhus. The state of the system, as well as the effects of seasons of the year, has I believe considerable agency in superadding the remittent character to an intermittent, as well as the typhus type to the remittent. It will also perhaps be induced, when the miasma may exist in greater quantity than usual, or when such miasma may be accompanied with circumstances calculated to debilitate the system; as when miasma may be united with moisture, as at the Walkill, or upon draining marshes in general; especially when the causes are combined with great heat of climate, as in the southern states. The swamps of North Carolina, we are told by Dr. Williamson, were remarkably healthy before the sun had access to the surface of the earth. But after the processes of clearing and draining, the sun then exhaled the most deadly

vapours. But it is also to be observed, that intemperance and the confined cabins of the poor, under such circumstances, also give this tendency to the remittent form of fever. Remittents on the other hand become intermittents, where the intestinal canal is well cleansed, and all irritation from this source has been removed, and nothing but miasma or the former habit of returning paroxysms remain. Nor are intermittents and remittents cured by the same means. An emetic, an anodyne draught, and the Peruvian bark will cure the one, but not the other. Bark and wine in the remittent will be injurious, and will frequently convert it into the continued form of fever, by the excitement they produce. It is important then, as it regards distinction of symptoms, to place these diseases under different heads, but still more so as to the cure, for we shall find very different and even opposite treatment called for, according to the causes producing them. Hence, then, I have made three heads.

I. INTERMITTENTS, which I define to be those fevers arising for the most part from marsh effluvia, consisting of repeated (not many) paroxysms, with a manifest intermission, and returning with remarkable exacerbations, and in general with shivering, most usually but one paroxysm in a day. The first of these is,

1. *The quotidian*, which has similar paroxysms, returning about every twenty-four hours; and the paroxysms generally in the morning, and under sixteen hours' duration. The interval, as it is improperly called, is considered as embracing the whole period of time from the commencement of one paroxysm to the commencement of the next. The quotidian, it is to be remarked, does not always occur in the morning. Dr. Good remarks that intermitting fevers, whether quotidian, tertian, or quartan, have their paroxysms recur regularly in the day time—the quotidian in the morning, the tertian at noon, and the quartan in the afternoon; and that in no instance do the paroxysms take place at night. Dr. Good, with all his abilities and extraordinary erudition, and although an eminent surgeon and poet, has, I suspect, never been particularly conversant with fevers.

The second form of intermittent is the *tertian*, in which similar paroxysms return about every forty-eight hours. The

accessions of the tertian take place, for the most part, at noon, and are under ten hours' duration. This is not invariably the case.

A third form of intermittent is the *quartan*, in which similar paroxysms return about every seventy-two hours, and the accessions generally in the afternoon, (paroxysm under eight hours' duration.) This form of fever is of less frequent occurrence. I have seen but three or four cases in twenty years.

There are, however, other forms noticed by writers, in which the intervals are still longer. Hippocrates notices *quintans*. Van Swieten mentions a quartan being changed to a *quintan*. Burserius quotes twelve physicians who have seen *quintans*. *Septans*, or *septenaries*, are also recorded in the books. Boerhaave expressly states that he has seen a fever which returned every seventh day; and Burserius quotes nine persons who have seen septenaries. *Octans* I have seen frequently. A case occurred in my own family, in the autumn of 1812. My attention was first called to this form of intermittent by the elder Dr. Bard, who had in his long practice met with it so frequently that he was led, in every form of intermittent, to continue the bark until the eighth day had passed by, counting from the day of the last paroxysm. Burserius refers to sixteen persons who have seen octans. Dr. J. Bard went still further; he has remarked that some fevers he has known to return at the end of fifteen days. But all these forms are considered by Dr. Cullen as only irregularities of the tertian or quartan periods. For- dyce, too, considers them as so many varieties of the tertian type; that they are all tertians in disguise. Nay, he states, as you will see in his first dissertation, that all fevers, whether continued or intermitting, are but varieties of the tertian type of fever; a doctrine calculated to destroy all distinctions, as well as those rules of practice which arise out of them.

The most usual forms of intermittent are then, 1. *Quotidians*, occurring every twenty-four hours, coming on in the morning, and lasting sixteen hours; 2. *Tertians*, occurring every forty-eight hours, coming on at noon, and lasting ten hours; 3. *Quartans*, occurring every seventy-two hours, coming on in the afternoon, and lasting eight hours, and generally but one paroxysm on the day of the attack. It is also observed by some writers, that the paroxysms do not often occur at night,

alleging as the reason, that they are counteracted by sleep. This is not true. In some of the cases already referred to, the paroxysms changing their hours of attack, they at length returned at one, two, and three in the morning, attacking the patients when actually asleep; and such is the effect of habit, that they as readily recur at these hours as the propensity to empty the bladder with those who are accustomed to evacuate water at a particular hour. This leads me to remark another distinction made by physicians, into *anticipating* and *postponing* intermittents; that is, that they regularly return either an hour or two earlier or later than the preceding paroxysm. They are hence called anticipating quotidiens, tertians, or quartans, postponing, &c. It is important to attend to this fact. It aids our prognosis. In the anticipating the disease increases in violence. But in the postponing, the disease is becoming less violent and is more easily cured. Another distinction of intermittents is founded upon the number of paroxysms on the day of attack. Generally, you will remember, they have but one paroxysm on the same day—but in some cases they have more—they may have two, or even three paroxysms on the same day. A tertian or quartan is then accordingly said to be a *duplicate* or *triplicate* tertian or quartan. This distinction, you will remark, is not applicable to a quotidian; for where the paroxysms recur so frequently it cannot be longer considered as an intermittent, but is a remittent, and soon displays the continued type.* *Tertiana duplicata*, *Tertiana triplicata*; i. e. having two or three paroxysms on the same day, but none on the intermediate.

Another variety to be noticed, is that in which the paroxysms return daily, but one day the paroxysms are severe, on the other mild. These are called, not duplicate, but *double tertians*, and *double quartans*. *Tertiana duplex*, i. e. the tertian every other day has similar paroxysms, equally violent; but on the intermediate day the paroxysm is mild and inconsiderable; and by this circumstance they are distinguished from quotidiens. This constitutes the *hemitritæus* of the

* But Burserius, in describing his quotidiens, gives to some of his varieties two or three paroxysms on the same day; but these are merely continued fevers, for the paroxysms are then protracted into each other without an intermission; yet he denominates them simple, double, and triple quotidiens.

ancients, the semi-tertiana of Cleghorn; i. e. where the paroxysms (according to their description of them) return daily, but where the interval between the first and second paroxysms, or rather the remission, is greater than that between the second and third; that again between the third and fourth more considerably than between the fourth and fifth, &c. There is, therefore, I assert, no difference between the semi-tertian and double tertian; for every other day the fit being more violent, the intervals between the different paroxysms will necessarily be different. In 1812, Dr. Post and myself both saw many cases of this double tertian type of intermittents.

Another variety is the *tertiana triplex*, having two paroxysms on one day, and one on the intermediate, but that a slight one. Tulpus goes still further—he gives you a case of a tertiana quadruplex, in which two paroxysms take place every day. What was this but a double quotidian? Tulpus tells us, too, that it supervened upon a double tertian. Lommius and Eller describe their hemitriteus as corresponding with the tertiana triplex of this day.

The quartan, too, may be duplex and triplex as well as duplicate and triplicate. Duplicate, you will recollect, signifies where two paroxysms occur every fourth day, and none on the intermediate days. But quartana duplex signifies that the paroxysms every fourth day are similar; i. e. only one paroxysm on the fourth day, but that a severe one; yet a slight paroxysm occurs on one of the intermediate days; so that the patient has only one interval day. In like manner, we may have quartana triplex as well as triplicate. Triplicate, you remember, has three paroxysms every fourth day, but none on the intermediate days. Quartana triplex has one paroxysm every fourth day violent; but it has a slight paroxysm on both of the intermediate days. Intermittents are also said to be *subintrant* or *subcontinued*; i. e. where a second paroxysm begins as soon as the first is ended; but in this case there surely cannot be said to be an intermission; it only amounts to a remission, the recurrence is so frequent. Quotidians, tertians and quartans, are also said to be *true* and *spurious*; they are called true, where the paroxysm is completed within twelve hours; but if protracted beyond that period, they are called spurious. The same is applied to double tertians, &c. The quotidian and tertian

are also distinguished into *universal* and *partial*—universal, when the whole system is affected—partial, when it shows itself only in a particular part of the body, as the head, (this form is of frequent occurrence,) the eye, &c.

This leads me to notice the arrangement of Alibert, who makes many distinctions founded on a particular symptom or symptoms; i. e. the *convulsive* intermittents; the *hepatic*; the *choleric*, *syncopal*, &c. Or he divides them according to the diseases with which they are associated, as *hydrophobic*, *catarrhal*, *exanthematic*, *rheumatic*, *epileptic*, &c. I also remark, that in some intermittents there is a greater tendency to assume the continued type than others. The quotidian are most apt to run into the continued form; the tertian next; the quartan least. Quintans, and the more protracted types, Van Swieten remarks, he never knew to be changed into continued fever. The question next arises, Why is the quotidian most, and the quartan least apt to assume the continued type? In order to answer this question it is necessary to observe, that the quotidian has the shortest cold stage, but the longest hot stage, or stage of excitement; and that the whole paroxysm is longer than the other forms of intermittent. That the tertian form has a longer cold stage than the quotidian, and a shorter hot stage, but that the whole paroxysm is shorter than the quotidian. That the quartan has the longest cold stage,* and the shortest hot, and that the whole paroxysm is the shortest of the three. The quotidian, therefore, having the longest paroxysm of excitement is most debilitating, for the interval being shorter there is less opportunity of giving either medicine or nourishment to restore the tone of the system—hence, therefore, the worn down solids and vitiated fluids tending to the continued form of fever; the system is consequently rendered more excitable by the original or additional causes of irritation. A further evidence of the correctness of this view is, that when tertians or quartans become continued fevers, there is first a reduplication of their paroxysms on the intermediate days, assuming the quotidian character. In like manner the quotidian becoming

* Dr. Grant, in his *Observations on the Diseases of London*, states that he has seen the cold stage of the quartan continue fifteen hours. It usually lasts but about two hours. Still it is remarked that the feeling of cold is not so severe and depressing as that of the tertian, though longer in duration. Hence, too, the quartan type is peculiarly severe and dangerous to those advanced in life.

continued, its paroxysms are first lengthened into a remittent, when the chill is scarcely perceptible; and in proportion, too, as fevers have this tendency, the cold stage diminishes at the same time that the hot lengthens; that is, the system even during the period called *apyrexia* is under some irritation from the accumulation of the cause, or from the state of the system itself. Hence there is less chill and more excitement; and when these changes are perceived, and a tendency to the continued type appears, let it teach us to be more active in our treatment to prevent such fermentation, and to procure longer intermissions. In simple tertians and quartans we have a perfect *apyrexia*, for the system is less debilitated. When there is a longer chill there is no additional source of excitement to rouse the vessels into immediate reaction, as in *quotidians*, or the double tertians. From the length of the chill, therefore, we may be enabled to foretell the nature or type of the intermittent that is to ensue, whether it be a *quotidian*, a *tertian*, or a *quartan*. When, therefore, Galen says a physician should know the type of fever from the first paroxysm, he speaks like a man of experience and great practical observation. His directions for ascertaining a *quotidian*, viz. "when the heat is joined with acrimony," indicate the same practical attention to the phenomena of disease; i. e. the vitiated state of the system having taken place, Galen tells you that the continued type of fever is approaching. The body, he observes, then abounds in crude humours. I have also in this city, in the hot season of the year, seen in intermittents, especially on the days of attack, the most malignant symptoms indicating such deranged state of the fluids, but which on the intermediate days were relatively removed by a profuse perspiration, which took place in such paroxysms. I am therefore not surprised at the malignancy attached to intermittents by Cleghorn and other writers, who have witnessed their character as influenced by a hot climate. It is also observed by all practical writers, that vernal intermittents are less apt to become continued, and autumnal most so. This fact may be explained from the septic state of body, and other circumstances of season, state of the atmosphere, decomposition of animal and vegetable matters which occur in autumn, but not in the spring. Such are the observations we have to make on the character of intermittents.

LECTURE XXV.

TREATMENT OF INTERMITTENTS.

THE treatment of intermittents which is now to be attended to, may be divided into the treatment proper to be pursued *during the paroxysm*; and the means to be made use of in the intermission, to *prevent its return*. The remedies proper to be administered in the invasion of fever in general, or the cold stage, those proper during the state of excitement, or the hot stage, and those called for in the succeeding stage, have already been very fully noticed. The same indeed, which were then pointed out, are no less applicable in the treatment of the different stages of intermittents—as for example, our object is in the first stage, to quiet the irritation of the nervous system by means of opiates, warm bathing and warm drinks. To reduce the excitement of the arterial system which succeeds, by the different evacuations, which have been pointed out, according as the one or the other may be necessary; and by various tonics and stimulant nourishment to supply the loss of strength that may have been induced when the sweating stage has taken place, and the febrile excitement has subdued. On these subjects, therefore, I need not now detain you. I may, however, remark that, both in the treatment of intermittents and remittents, when you may be called upon during the paroxysm, you will administer very much to the comfort of the patient, by the exhibition of opiates, and that too, not only in the cold fit, but oftentimes also in the hot stage,*

* It is a common opinion," says Lind, "that the cold fit is attended with the greatest danger, and that most who die of intermittent fevers expire during the

with the exceptions already pointed out, as in great fulness of habit, or an inordinate determination to particular parts of the body, as to the head or chest; but, under the usual irritations which we meet with in intermittents and in remittents, we administer opiates with the best effects in the hot as well as in the cold stage. They diminish the rapidity of the circulation, they usually promote diaphoresis, they correct and lessen the heat, which is itself a source of great irritation, and they in all respects, compose the feelings of the patient; they allay pain, they remove the anxiety and oppression which patients frequently suffer during the paroxysms of fever. They invariably shorten the paroxysm, and never augment its violence. Opium may be given if the stomach be much disturbed, in weak mint water, as its vehicle, or in case of much heat and excitement, the combination before mentioned, with sp. mind. is to be preferred, or the Dover's powder, grs. x. In a quartan of two years' standing, in St. Thomas' Hospital, Dr. Fordyce successfully prescribed a full dose of Dover's powder, with a sweating draught of the carbonate of ammonia two hours before the fit—the bark afterwards effected the cure. Dr. Lind, who was the first to introduce this practice, of administering opiates in intermittents, and which he did as early as 1766,† always considered them useful by shortening the paroxysms, and thereby bringing on an intermission. This fact is no less favourable to the doctrine, that irritation constitutes the proximate cause of fever. In cases of costiveness, it was his practice to blend a cathartic with his opiate; that after the opium had produced its effect, the cathartic might leave the bowels in such a state that he might immediately after avail himself of the opportunity of administering the bark. This, in a hot climate, became doubly necessary. The cathartic which Dr. Lind usually blended with the anodyne, was the tinct. sacrae. \mathfrak{z} ij.; but under other circumstances, his opiate draught was as follows: xv. to xx. drops lauda-

rigors. I never saw a person die in the cold fit, but have known several carried off in the hot one, by strong convulsions, delirium and other symptoms; and am clearly of opinion, that it is the hot fit or fever, which most endangers the patient's life, and by its continuance, weakens and impairs his whole habit of body. In old age, the cold stage is most dangerous.—See Lind, p. 318.

† Hot climates, p. 318, 322, 323.

num; ℥ij. syrup of meconium; ℥ij alexiter spirit; ℥ss. aq. font. This was his draught in the hot fit.

The next indication, therefore, is to prevent the recurrence of the paroxysm. The first means of effecting this object, is to avoid the remote causes; to prevent the exciting cause from operating on the system, (that is, as far as that cause may depend upon external circumstances.) With this view let your patient get out of the way of it, by avoiding the air; if in marshy and moist situations, let your patient be removed to elevated grounds, to a dry and sandy soil. In like manner, let him go from the interior country to the air of the sea shore. Lind, (page 313,) speaking of the effects of sea air, observes, that this change of atmosphere is "one of the most effectual means of obtaining a cure;" and adds "that the most obstinate intermittents he ever had seen, were thus cured"—that they did not experience a single fit after they were on board ship. In like manner, a little daughter of mine was thus cured of an obstinate quotidian by means of sea air. I took her to Long Branch after being much reduced by it; she had not a single paroxysm more, but returned in three or four days perfectly restored. I have known persons from Dutchess county, members of Dr. Bard's family, where they were under the influence of an obstinate intermittent, to come to the city. And when the city is unhealthy, I frequently send my patients to the country, especially to places where the situation is elevated and dry. It is, however, more frequently my common practice to send children, with whom it is always more difficult to cure the disease by other means, to the sea shore, to Staten Island, and situations where they experience the sea breeze before it is much mixed with the land air. It is another proof, besides those I have already mentioned, that the salt atmosphere extends beyond the spray of the sea, that intermittents very rarely occur, even within some miles of the sea shore. In the treatment of remittents this stimulant effect of sea air is no less manifest; its stimulant effects are also very apparent in other diseases—as in pertussis, chronic catarrh, bowel complaints of children, which indeed I consider to be the remittent in disguise—the infantile remitting fever of Dr. Mann.—(See his Prize Dissertation.)

Secondly: When the poison is in the system, when the habitual recurrence of the fever is established, and the hour of its return is ascertained, our object is still to prevent the system from suffer-

ing a return of the paroxysm. For this purpose, we have various resources : we may diminish the sensibility of the system to its action. This may be done, 1st by opium, administering it, say two hours before the fit is expected to return. But with this view it must be recollected, that a larger dose is necessary to counteract the irritation attendant on the paroxysm of this disease, than is exhibited under ordinary circumstances : from 50 to 100 drops should be given to an adult to obtain its full effects. It should also be exhibited in some agreeable vehicle, lest it be rejected from the now irritable stomach. The patient, too, should remain in bed, and in a perfectly quiet and a dark room ; its operation should also be aided by some tepid drinks, to secure its effect upon the extreme vessels, as a cup of catnip, or some other herb tea, or wine whey. It is a good general rule with regard to all medicines, that the patient should not know the medicine he is taking ; in the present case, particularly, if the patient should neither know the medicine nor the dose he takes. The same precaution is necessary in administering arsenic, otherwise his prejudices and his anxiety will counteract the effects we intend it to produce. Laudanum too, is preferable to opium, as it is quicker in its operation ; but another form, to secure its febrifuge effects, especially upon the surface, is to blend it with aq. ammon., say thirty drops aq. ammon. with from fifty to sixty or eighty drops of laudanum. This combined, I have found much more effectual than the laudanum alone. 2d. Put the system under a new and stronger irritation than the operating cause. "Every means," says Dr. Blane, "of inducing a powerful excitement in the principal functions of the body, at the period of attack, seems to possess a power of preventing it." Bisset, in his *Medical Constitution of Great Britain*, recommends the vol. alkali to be given, in doses of xv. or xx. drops every hour. Various vinous or spirituous drinks are also recommended. Spiced wine whey, &c. before the paroxysm, covering the patient warm in bed ; cider, made hot with ginger, and taken off too as hot as it can be swallowed. Rum, brandy, gin, whiskey, and usquebaugh, (the celebrated Irish potation, which is distilled with cloves or other spices,) are all prescribed as sovereign cures, or rather preventives of the paroxysm of an intermittent. It is surprising too, the quantity that the system will bear under the irritation of this disease, and indeed, which under other circumstances would

destroy life. A half pint of rum, brandy or gin, medicated toddy, with the addition of a tea-spoon full of pepper, or highly spiced with nutmeg, (a whole nutmeg is taken at a dose on these occasions,) grated into it, or other aromatics, is a common prescription to prevent the fit of an intermittent. I knew in one instance, a bottle of brandy to be taken off with this view; it cured the disease, but the man was deranged while under the influence of the remedy. Some again, have recourse to various other stimuli, as the spirits of turpentine, a table-spoonful before the fit; the juice of rue or of groundsel, a pint of the infusion of horse-radish, $\frac{1}{2}$ oz. of mustard seed in half a pint of gin as its vehicle, three mornings successively, or a large dose of capsicum, as recommended by Collins, *Med. Com.* vol. ii. Indeed, there are hundreds of prescriptions of this kind that are employed in this way;* but they all resolve themselves into the same principle, that of exciting a new and stronger irritation, which destroys or counteracts that of the disease. With the same view, porter has also been taken with the best effects, to prevent the paroxysm of an intermittent.

In 1779 or 1780, after suffering a very tedious intermittent, for it resisted all the means that were then usually prescribed as bark, the infusion of lign. vit., &c., I had recourse to a bottle of porter, as directed to me by a sea-captain. In 1784 or 1785, I had an attack of the same disease when at the academy of Hackensack, and was cured in the same manner. Lind throws out the idea, that some particles of arsenic may exist in the glass, which are given out when ignited, and are thus conveyed in the beer. This is improbable and unnecessary. Arsenic is not so immediate in its effects, but requires three or four days. At all events, porter is one of the best auxiliaries that can be made use of in the cure of intermittents.

The practice of bathing, also deserves our notice—that of immersing the patient in a hot bath, both before and during the invasion, and keeping him in it until the fit passes over; for this purpose, the bath should be heated to 96° or 98° at least, and you will also add to the stimulating effect of the bath by administering to your patient at the same time, a bowl of wine whey.

* See Lind, p. 313, where indeed you will see a catalogue that will surprise and amuse you.

I have also made use of a cold bath with similar good effects, administering it a short time before the paroxysm is expected to return. Applied in the form of a shower-bath is the most powerful mode of applying it. Or, in case of a young subject, let him stand in a large tub, and a pail of cold water be suddenly poured over him a short time before the fit is expected to return. This secures the stimulant effects of cold. In this way, in the autumn of 1811, I cured one of my sons, and other children in the same family in which I resided, in the neighbourhood of this city. But, as I have formerly observed, the effects of cold water, as the means of preventing the return of intermittents, depend both upon the state of body in which it is applied, and the manner of its application. It is, accordingly, a fact well ascertained, that at the sea-shore, both at Long Branch and Rockaway, it frequently happens that persons who go in to bathe, bring back the disease, although they may have been freed from it by residing at the shore. Yet omitting the bath, and continuing to respire the sea-air, they would soon escape the disease, and rapidly recover their strength. The solution of the fact is this: that many persons go there very much debilitated. The heat generating power being reduced, the cold-bath, especially when applied by immersion, and the patient perhaps remaining in the water a considerable length of time, debilitates him by carrying off his caloric: whereas, the salt air, exciting the system, and improving the appetite, immediately counteracts the return of the disease. But if the person using the bath be not greatly weakened, and suddenly plunges into the bath without remaining in it, in that case its stimulant and beneficial effects will be secured to the patient. Its operation, therefore, depends both on the condition of body and the suddenness and duration of the cold that may be applied. The stimulus of exercise, as fast walking, running, or riding on horseback, a short time before, or when the fit is expected, has prevented the return of the paroxysm. The remedy as recommended by Asclepiades, of putting his patient on horseback to open the pores that are obstructed, is perhaps now admissible. Upon the same principle, powerful stimuli, applied to the more sensible parts of the body, have been found useful. Blisters, applied six or eight hours before the paroxysm, to the inside of the arms, thighs, wrists, or ankles, are remedies of great efficacy: or stimulating plasters—as the celebrated frankincence

plaster, which is prepared as follows: Thuris, ʒij.; tacamahaca, ʒi.; croci, gr. x.; terebinth Venetæ, q. s. Mesceantur ut fiat emplastrum carpis applicandum. (See Lind, 312.)

2d. Plasters of Burgundy pitch, either alone or combined with a proportion of blistering ointment, say one-eighth, or one-tenth, constituting the emplastrum calidum. Or,

3d. Lind recommends, among other applications, common salt, beat up with the whites of eggs, (Lind, 312,) to be applied to the wrists or ankles.

4th. Garlick, beat up with hog's-lard, is applied with the same intention, either to the wrists, or as sinapisms to the soles of the feet, or rubbed upon the spine.

5th. The oleum succini, oil of amber, is also made use of, and is among the best of the external applications. This may be applied to the wrists, or it may be made use of by anointing the spine with it.

6th. Among other stimuli, made use of to prevent the return of the paroxysm, is directly exciting the heart and larger vessels, by arresting the flow of blood into the extremities, generally one of the upper and one of the lower, by means of tourniquets. This remedy was, I believe, first recommended by Mr. Kelly. You will see an account of it in the 2d vol. of the Annals of Medicine. To produce this effect, it is directed to be applied from ten to fifteen minutes either before or during the cold fit. But we have yet another resource, that of impressing the nervous system through the medium of the mind—calling into operation the principle of faith—and which Dr. Rush introduces almost as a distinct faculty of the mind. It is upon this principle, probably, that the celebrated amulets (abracadabras) and little bags suspended about the neck, containing a few grains of camphor and saffron, operate in counteracting the nervous irritation constituting the habitual return of fever. And with all deference to the learned gentlemen of the great metropolis, who have been of late so earnestly engaged in the discussion of the principles upon which this disease is cured by the late fashionable prescription of sourbugs, bruised spiders, cobwebs, gr. x., and the snuff of a candle, I believe we must seek for the solution in their operation through the medium of the strong mental impression which these disgusting substances are calculated to produce. Shakspeare's cauldron of the witches exhibited to Macbeth, is not made up

of more strange and terrific materials than are exhibited in this disease. His cauldron, you know, is made up of

“Root of hemlock, dig’d in the dark;
Maw and gulf of salt sea shark;
Toad, that under the cold stone,
Days and nights has thirty-one;
Eye of newt—toe of frog;
Wool of bat, and tongue of dog;
Adder’s fork, and blind worm’s sting;
Lizard’s leg, and howlet’s wing.”

In ours,

The herb of wormwood, dried in the dark;
Wool of hat;
Juice of rue—snuff of candle;
Spider’s web, and crawling bug—
“Make our charm of powerful trouble.”

But although the various stimuli, we have enumerated, frequently prevent the return of the paroxysm, we are sometimes disappointed. I have even known, in the case of a quotidian, an abscess to form of considerable size, and to be opened on the morning of the fit, and yet that irritation was not sufficient to prevent the return of the fit! Whether we succeed or not, it will be proper, in the interval of fever, to administer the more permanent stimuli, or some medicines, as provided for in the third indication, which is,

3d. To produce a permanent state of excitement, and to diminish the sensibility of the system by tonics. By tonics are not meant diffusible stimuli, which are indicated in cases of sudden exhaustion of the nervous system; but such remedies as are calculated to make more durable impression upon the whole system, and at the same time to give vigour to the muscular as well as the nervous fibre. Diffusible stimuli are addressed more especially to the nervous system. Tonics, or permanent stimuli, to the muscular as well as the nervous system; i. e. to the circulating, the exhalent and absorbent vessels, as well as the organs of voluntary motion. Tonics are also distinguished by their not being followed by the depression that most usually succeeds to the diffusible stimuli. The impression of tonics is more slow and gradual, while that of stimulants is quick, but transient. Tonics, when

long continued, we know lose their effect, and become inert, but they do not leave debility behind them.

Their effects are,

1st. To excite the nerves of the stomach; to promote the appetite; to increase the secretions of the stomach; to improve their quality, as well as to increase their quantity; to quicken the solution of the food; to promote the peristaltic motion of the whole intestinal canal; accordingly we find some persons incapable of digestion, or of performing other functions of the intestines, without their use. With this view, a patient of mine who labours under a dyspeptic stomach, cannot digest her food without taking her habitual dose of bitters an hour or two after eating. Others I know who are in the habit of taking a dose of bark daily, as a cathartic.

2d. Their operation is to excite the lacteal system.

3d. To promote the action of the heart and arteries; and,

4th. Of those tonics which are not astringent, to excite the excretions, as we see in the effects of iron in promoting the menstrual discharge; but not so with bark, except in cases of extreme debility.

5th. Tonics also have the effect of exciting and contracting the exhalent vessels when relaxed by debility, as in cases of excessive menstruation, or an inordinate excretion by sweat.

6th. They promote the action of the absorbents. With this view we prescribe iron and bitters in that form of dropsy which succeeds to long continued fevers and other diseases.

7th. They operate upon the nerves throughout the system by quickening their power of action; and,

8th. They also, probably, operate through the medium of the fluids, as well as by the nerves, upon every part of our frame. This is especially rendered probable by some of the late experiments of Sir Everard Home, showing the action of various substances through this medium of communication.

The medicines prescribed with this view to their permanent tonic operation, are of various kinds. They are of two classes, viz. vegetable and mineral tonics. Of the first class are Bitters. These again are divided into,

1. Such bitters as are pure; i. e. as containing the bitter principle, unaccompanied either by aromatic or astringent matter: for it is now ascertained, as you will see by consulting Thomp-

son, that there are certain plants which possess this exclusive character, and are hence denominated pure bitters.

2d. There are bitters which possess, in addition to this bitter principle, more or less of an aromatic quality, residing in an essential oil, which the plants referred to contain ; and,

3d. There is another description of bitters which are blended with an astringent matter, or tannin, as it is now denominated. The plants which fall under the head of pure bitters, and which are in most general use, on account of their tonic qualities, are,

1. The *marrubium vulgare*, or horehound of the class of plants called in the Linnean system, *didynamia*, *gymniospermia*. Natural order, *verticillatæ*. The whole herb is made use of in infusion—to be taken cold—an excellent tonic, not only to the stomach but the whole system. Hence, too, it has come into general use in chronic catarrh; not that it possesses any specific effects upon the lungs.

2. *Tanacetum vulgare*, or tansy. Cl. *syngenesia*. Ord. *polygamia superflua*. Herb and flowers, used as a tonic in intermittent fevers, and as a vermifuge.

3. *Ruta graveolens*—rue.

4. *Eupatorium perfoliatum*; is also used as a domestic bitter, and certainly with excellent effects.

5. *Artemisia absinthium*.

6. *Anthemis nobilis*—chamomile. Possesses the same properties. A small quantity of essential oil, sold in the shops—useful in a voyage—in small compass, yet powerful. Useful in diseases of the stomach, but less active in diseases of the whole system. The cold infusion preferable. A tea-cupful of the flowers—boiling water, ℥ij. when cold, ad libitum. But the most powerful are the three following.

7. *Gentiana lutea*—root. Infusion with orange-peel. Tinct. compos. Tinctura amara.* A grateful bitter, with orange-peel. It is a basis of the infusum amarum.

8. *Quassia amara*, or excelsa.

Colomba plant, not much esteemed; is supposed by Professor Willdenow to be a species of *Bryonia*. Formerly said to be

* Its composition.—Rad. gentian, ℥xij.; cort. aurant, ℥vj.; canell. alb. ℥ij.; coccinell, ℥ss.; boiling water, ℔i., digest one day. Brandy, ℔xv. Digest seven days, or filter.

brought from Ceylon, but lately found to be the produce of Southern Africa; and is a great article of trade with the Portuguese at Mosambique, in the province of Tranquebar. Aromatic smell; bitter taste; powerful and grateful stomachic.

Infusion—Columbo, ʒij.; quassia, ʒij.—orange-peel, ʒi.; rhubarb, ʒi.; soda, ʒss.; water, ℥iiss.—boil to ℥i.—strain—take cold.

2d. Bitters, with aromatics, uniting the stimulant and tonic qualities.

1. *Dorstenia contrayerva*, commonly used like *serpentaria*, as a stimulant in typhus, gr. v. to ʒi.—it has fallen into disuse.

2. *Aristolochia serpentaria*, Virginia snakeroot. It is a stimulant, formerly much used in the typhoid type of fevers. Diaphoretic and tonic.

3. *Citrus aurantium*, the orange and *Cit. medica*, lemon, usually combined with the purer bitters. An ingredient in the bitter infusion of the shops.

The 3d class of tonics, now to be noticed, are bitters, blended with the astringent principle that is in combination with tannin. I may just remind you, that there are certain tests by which the presence of such astringent principle is ascertained. The principal are the following.

1st. Astringents strike a dark purple or black colour, when acted upon by the salts of iron.

2d. They possess the property of corrugating the animal fibre, as is evident when they are applied to the tongue; and

3d. Some of the most powerful astringents show the presence of the peculiar acid called the gallic acid, or that kind which is obtained from galls; these are the produce of an insect, and as their place of growth is the bark of the oak, which is remarkable for its astringency, this acid, and the astringent principle, have been considered as one and the same thing. It was also discovered that the gallic acid in connection with the salts of iron, strike a dark colour. This circumstance afforded still stronger evidence that the gallic acid constitutes the astringent principle. But it has been ascertained that the acid alone possesses very little of this astringent quality, and that it is scarcely perceptible; that the colour is not so dark as that created by astringents; and still further, it has been found that some of the most powerful astringents are wholly destitute of the gallic acid, as the gum kino and catechu.

Seguin has discovered that the astringent principle is constituted by a totally different material. He has ascertained that by mixing gelatin with an infusion of the substance containing the astringent principle, a precipitation takes place, containing the astringency, and leaving the liquor above altogether destitute of it. To this precipitate he has given the very appropriate name of tannin, so called, from the great application which is made of it for the purpose of tanning leather. And in this he has made a discovery of very great importance, particularly in that art, for by this process of concentrating the astringent matter by means of gelatin, leather may be tanned in fewer weeks than it formerly took months, and thereby an immense capital saved.

The process consists simply of adding a quantity of fish glue to the vat containing the bark, in a state of infusion; the astringent matter instantly falls to the bottom, where it is brought immediately in contact with the hides to be tanned, whereas by the former process it required a great length of time, at least eight or ten months, to produce that change which is now effected in the course of six weeks.

The most important of the class of tonics possessing that astringency in connection with its other properties, is the Peruvian bark, or *cinchona officinalis*. It was introduced into Europe in 1632. There are at least twenty-five varieties of *cinchona* well known, besides the recent additions made by Humboldt and Bonpland.

The *cinchona officinalis*, or Peruvian bark, is the produce of different plants. They all, however, belong to the class, *Pentandria*, order, *Monogynia*, and to the same genus. It is the growth of South America. There are three kinds of it used commonly for medicinal purposes, viz: the *cinchona lancifolia*, (the pale,) the *cinchona cordifolia*, (the yellow,) and the *cinchona oblongifolia*, (the red.) The pale comes in small quilled twigs, and thin. The yellow in flat pieces, and the red in large flat, thick fragments. And they vary in colour as their English names indicate. Of these three kinds, the pale is the least powerful, and the yellow the most. But the red is the least offensive to the taste. The yellow is so intensely bitter, that it is apt to nauseate. But as it is the most efficacious, and more readily yields its bitter and astringent principles to both alcohol and water, than the others, and as the red bark is so very frequently adulterated, and withal is so expensive, the yellow bark is generally preferred in prac-

tice. The yellow is said to be the genuine, original febrifuge of Spanish America.

Before you give the bark, take care thoroughly to cleanse the stomach and bowels, and freely to open the skin. This is highly important. In hot climates, it is often necessary to administer the bark before the apyrexia: there is no time to lose. But in our climate, it is proper to wait for the entire solution of the paroxysm. It should be given soon after the apyrexia has taken place, and discontinued some time before the expected cold fit, otherwise its administration will aggravate the succeeding paroxysm. It is not safe or proper to give it when there is any visceral obstruction, or a strong tendency to local inflammation.

The most effectual mode of giving the bark, is in substance, in doses of \mathfrak{z} ss. to \mathfrak{z} i. (i. e. about a tea-spoonful) every two or three hours. To give less is to trifle with a valuable remedy. Lime juice is a convenient and agreeable addition to it. The following is an excellent form: R. cinchon. \mathfrak{z} i.; succ. limon. \mathfrak{z} i.; elixir paregoric, \mathfrak{z} ij.; aq. com. \mathfrak{z} vij. M. This quantity will make eight doses; or it may be given in milk, in coffee, or in wine, being rubbed up into a paste. It is sometimes given in the shape of an electuary, thus: R. cinchon. pulv. \mathfrak{z} i.; super-tart. potass. \mathfrak{z} i.; cario-ph. aromat. \mathfrak{z} ij.; syrup, q. s. M. A very good way of exhibiting the bark in substance, is to wrap up the dose in a large wafer, made of a paste composed of two teaspoonsful of wheat flour in a teacupful of water, and passed between two hot irons well waxed. Let the wafer be moistened with a little wine, and then folded over the powder. It will then readily pass down as a bolus, especially if taken in a spoonful of wine. In this way, this nauseous article will be retained upon the stomach, which will reject it in every other shape.

The bark may also be given in infusion. R. cort. cinchon. \mathfrak{z} i.; magnesiæ calcin. \mathfrak{z} i.; aq. pluv. distillat. \mathfrak{z} x. filter. This is to be taken cold, as when warm it is offensive and nauseating, and lime juice may be added to it with advantage. I do not think this mode of administration very efficacious, though in some cases it may be the best you can adopt. But generally it cannot be depended upon in intermittents.

Next to the actual substance, the decoction has been long found the best mode of giving bark. In making the decoction care should be taken to boil it in a close vessel, and but a short time,

otherwise you evaporate its virtues, and destroy its strength. The decoction should be made with one ounce of the bark to a pint of boiling water ; and of this from two to four ounces should be given at a dose. To this, the serpentaria, (ʒij. to the above,) may be added, especially if the stomach be very irritable, and the patient has some remnant of fever, and is much debilitated.

Another mode of giving bark is the tincture ; and this is an elegant, and often a very powerful, prescription. Huxham's tincture is the best form. I frequently have given it alone, and sometimes in the infusion or decoction. Indeed, in the summer season, it is very frequently necessary to add the tincture to the watery preparations.

The bark may be given in extract, in doses of from five to fifteen grains. But this is a very uncertain form, as it is rarely properly prepared. The heat injudiciously applied in the pharmaceutical operation, frequently drives off or destroys all the virtues of the article.

You may find it necessary sometimes, when the stomach will retain nothing, to resort to the administration of the bark by enema. In this way it may be thrown up with milk ; or the following form may be used every four or six hours. Take of the powdered bark ʒss.; laudanum ʒi.; starch ʒij. M. After the first injection, thirty drops of laudanum will be sufficient ; and for young children, ten drops will be quite enough to produce the torpor of the bowels necessary to retain the injection.

I have sometimes, and with great advantage, applied the bark externally, by means of the bark waistcoat, the endermic method, as it is called in modern phrase. With children especially, this may be used with benefit, when it is found impossible to make them swallow any thing.

I have mentioned these different modes of administering the bark, because you may sometimes find it necessary to resort to them, and may be placed in situations in which you can do nothing else. But they have all been superseded, to a great extent, by the quinine, a preparation introduced some years ago, containing all the essential virtue of the crude material, without its disadvantages. It has been said that there are cases which the sulphate of quinine will not cure so readily as the substance itself. But its efficacy, under the circumstances in which the bark in other forms is indicated, is now well established. It may

be given in pill, in doses of one or two grains, three or four times a-day. It may be given in solution. I have generally used the following formula: R. sulph. quin. \mathfrak{z} i.; elixir vitriol, \mathfrak{z} i.; syrup of ginger \mathfrak{z} ij. M. A tea-spoonful every hour, or every two hours during the apyrexia. Or it may be given by enema. Children will seldom swallow the pills, and will frequently refuse the solution. The extreme bitterness of quinine will revolt them. You must then resort to the injection. Dissolve four grains of the quinine in three or four ounces of water, and add to it eight or ten drops of laudanum, and administer it.

From some curious experiments very recently made in France, it would appear that quinine applied in the endermic mode, that is, externally applied, is very efficacious in curing intermittents. I have no experience whatever as to its virtue in this way. But it is said that quinine rubbed up with cerate, and applied to a blistered surface, is productive of very striking curative power. It is even said that it manifests its activity, when thus used, in a few minutes. Should further experiments verify these assertions, it certainly will be an invaluable remedy, because sometimes it cannot be taken internally, except with great difficulty; and in some cases, as for instance when there is a strong tendency to local determinations, and perhaps a disposition to gastric and intestinal inflammation, it cannot be internally administered with safety. But from what I can judge of the experiments which have been thus made with it, it does by no means appear very clear, that the quinine effected the cures. In all the instances, I believe, blood-letting was first resorted to. But still it is worthy of a trial.

Sometimes you may find it best to give the quinine in comparatively small doses frequently repeated. There is, I have found, frequently an advantage in this. But generally the best way is to begin with large doses, to be given at more distant intervals, so as to produce a strong impression at once. Even eight or ten grains have been given at a dose, and the Italian physicians give even more. But their fevers require very decided and peculiar treatment.

The introduction of the quinine is an invaluable acquisition in the practice of medicine. Combining as it does all the curative properties of the bark, it has the vast advantage over every other form of it, that it may be given in such small bulk.

A variety of other vegetable tonics, most of them of the cinchona family, have been recommended as substitutes for Peruvian bark, such as the cinchona caribæa, the cinchona floribunda, (St. Lucie bark,) the cusparia febrifuga, (called by Humboldt, the Bonplandia trifoliata,) the Swietenia febrifuga, and the Swietenia mahogani. But they are all greatly inferior to the Peruvian bark. I, therefore, shall not dwell upon them. You may learn their properties from the books; and the Professor of Materia Medica will tell you how they are to be administered, and what they are respectively worth. I have, myself, no very great confidence in any of them.

Certain mineral tonics have been recommended for the cure of intermittents. The chief of these are arsenic and iron in various forms.

Of the arsenic, Fowler's solution is the best: this is made by dissolving sixty-four grains of the white oxide of arsenic in $\frac{3}{4}$ xvi. of water, and adding to it sixty-four grains of the sub-carbonate of potash, and $\frac{3}{4}$ ss. of sp. lavend. compos. It is given in doses of from two to five drops, three times a-day, gradually increased to eight or ten drops. But, although I know it will cure intermittents, I cannot recommend it to you. It is a very dangerous remedy; and often leaves consequences far more formidable than any ague. A liability to rheumatism, most distressing derangements of the digestive organs, violent headaches, wonderful emaciation, and not unfrequently, unmanageable dropsies, are the sad consequences of its use. Indeed, for months and years, patients who have taken arsenic for the cure of fevers, suffer serious injury to health. Never use it, unless the disease should resist other means, or you should be placed in situations where none others are at your command.

Iron is far the safest of the mineral articles used in fevers. It is given in filings, in doses of from five to ten grains; in the form of carbonate, or rust, in doses of from five to fifteen grains; in the form of the sulphate, in doses of from one to five grains; in the shape of the muriated tincture, from ten to fifteen drops in wine, water, or syrup. But the best form of iron, and the one now most in use, is the Prussiate, (Prussian blue.) It is highly valued by some practitioners, and I have seen very good effects from it. It may be given in doses of from five to ten grains, gradually increased, three times a-day. Its being an inoffensive

article, and its being a very cheap one, are its chief recommendations. On this account it is very well adapted for use in large public institutions, where economy is required. I have used it a great deal in the New York Hospital, and have not been disappointed in it.

But with the quinine at your command, you need not resort to the use of any thing else, unless in some few cases, where some peculiarity in the disease, the patient, or the circumstances, may demand a preference for some other article.

I must remark that while you are thus building up the system, you must pay great attention to the diet and regimen of your patient. Improproprieties in these particulars, will counteract all that you are doing by remedial means. I need not dwell on these points, as I have already spoken upon them so fully. I merely remark in conclusion, that a judicious physician will never lose sight for a moment of the great importance of a vigilant regard to what his patient eats, and drinks, and does. There is nothing, however seemingly small, which has reference to these matters, that ought to be considered unimportant, or even of trifling moment.

LECTURE XXVI.

REMITTENT FEVERS.

REMITTENT fevers next come under our view. I have already remarked that remittents have been very improperly considered by many writers, and especially by Dr. Cullen, and by Dr. Philip Wilson, as well as by Fordyce, to be mere modifications of the intermittent type of fever—whereas, remittents differ from intermittents in many particulars. These are worthy your regard, especially as they lead us to adopt a different and more active treatment for their removal.

In the first place, I remark the remittent fever has not the distinct visible rigours and long cold stage that announce the intermittent form of fever.

2. The remittent has a much longer hot stage.
3. The sweating stage is inconsiderable and partial, and is frequently wanting altogether in the remittent.
4. In remittents there is no perfect apyrexia as after the paroxysm of an intermittent.
5. The causes, both predisposing and exciting, are usually different. The intermittents most usually are the effect of external causes, particularly marsh miasma, of cold, and intemperance, or they are renewed as already observed, by debilitating causes. Whereas, remittents ordinarily occur in a vitiated habit of body, so deranged by neglect of the intestinal canal—perhaps proceeding from bad food, or occasioned by the debilitating operation of summer and autumn, by intemperance, exposure to excessive heat, &c. And as they arise frequently from internal causes, from the state of the system, they also occasionally appear in the winter season as well as at other times of the year. And hence those

who do not discriminate between a bilious remittent and a yellow fever, will tell you, forsooth, and very gravely, that they have seen the yellow fever in mid-winter! It may be added, that it is very prevalent both in town and country—in the latter most frequently, occurring in the lowest situations. In a remitting fever when forming, the patient is oftentimes affected without the slightest chill; and the disease is slowly and gradually formed. So say Lempriere, Sir Gilbert Blane, Lind, Pringle, Niell, and Pym—who have all contended for the peculiarities of this form of fever. One day the patient is slightly indisposed, another day he is better, on the third day he is worse again. Whereas, in the yellow fever you see none of these alternations—in that, the disease is uninterrupted from the moment of the attack until recovery or dissolution takes place. The bilious remittent is also distinguished by various symptoms, viz: a loaded and yellow tongue, a foul offensive breath—the patient complains of a disagreeable and bitter taste in his mouth, headache, hot burning hands and feet, especially as night approaches. At this time, too, a degree of horripilation takes place, giving a sense of crawling, like the impressions created by hairs on the body. In some it creates the sensation of cold water running down the back—pains in different parts of the body are complained of—the appetite is impaired—the biliary secretion is sometimes slow, diminished, or altogether obstructed—costiveness follows—his discharges become more offensive than usual, and of darker colour—his urine becomes yellowish and muddy, at least somewhat turbid. In a few days after struggling against these symptoms and feelings, he is confined to his bed—his fever is increased, and the physician is called. Twice a day sensible exacerbations now show themselves—but no perfect apyrexia or intermission follows—each exacerbation, however, is preceded by a sense of coldness, but not the honest, undisguised shaking that ushers in the intermittent. Such is the condition of your patient—what is to be done? His whole system is now diseased, not only proceeding from external causes, such as marsh miasmata and moisture, and these perhaps, combined, but from a vitiated state of his bowels, a torpid state of the liver, the season of the year, his diet, and other causes. His whole system now exhibits the evidences of more or less internal derangement pervading the whole body, showing itself in the secretions and excretions as well as the solids of the system.

Our object then, must be, if possible, to simplify the disease by removing from the system every source of that complicated form of the disease which it now exhibits. In other words, to reduce it, if practicable, to the intermittent character, that is, to take away those internal causes, which give a peculiar malignancy to the disease. The means of effecting this are various.

1st. If the habit be full and the excitement considerable, the patient, perhaps, under the influence of the effects of habitual and previous intemperance, that is, when an inflammatory diathesis prevails, in that case venesection may be advantageously directed; but it is to be done with great caution, keeping constantly in view the tendency of this form of disease to the more continued form of fever, and especially to the typhus type. But when it may have assumed that character and the contagion of typhus superadded, constituting it the malignant bilious fever of authors, and in this complicated form is communicated from man to man, blood-letting is rarely admissible. Such was the case in the late typhoid form of bilious fever of Bancker street—venesection was altogether inadmissible in the cases that fell under my view.

2d. Emetics are especially important, not only from their effects upon the stomach and biliary organs, but upon the whole system. Emetics in the Bancker street fever were generally beneficial when early applied—with the exception of those cases where the stomach was previously impaired by intemperance or active inflammatory symptoms of the stomach, liver, or intestines, had supervened. Some few instances of this nature occurred, attended with black discharges as in typhus. But from a report, published by the Medical Society, it would be inferred that many such cases occurred. Not so. A more gross imposition on the public mind, I do not recollect to have witnessed. They would also lead to the inference that it is yellow fever they describe; but this is at once contradicted by the fact that it continued throughout the winter; and I also know that some of the same committee who have lent their names to this fraud, this imposition, did not believe it to be yellow fever. They declared this to me themselves—you then will judge. The same disease among the blacks occurred at Philadelphia. See Dr. Chapman's observations on this subject, who also considered it totally distinct from yellow fever. An emetic, says Stoll, frequently strangles it at a blow.

3d. In like manner, active cathartics, to cleanse the intestines of their offensive and putrid contents, should immediately be prescribed.

4th. Relax the surface by sp. mind. and laud. or by antim. and calomel combined. "Of all things," says Lind, "it is important to relax the body into an intermission."

5th. Apply blisters early in the disease, and thereby concentrate as far as may be practicable, the irritations of the system to a particular part—as far as practicable, convert the general into a local irritation.

6th. If the habit of body be plethoric, and the system is much excited, the skin obstinately dry and hot, make use of cold washing and cold drinks. But if the system be greatly debilitated, use tepid applications, in the form of fomentations to the limbs, and cataplasms to the feet; not *stimulant*, composed of mustard, nor applied hot, but *emollient* ones, consisting of vinegar and water, and applied moderately warm. In this case, too, the temperature of the patient's drinks should correspond with that of the external applications. Continue, also, mild aperient medicines, viz., magnesia, small doses of salts, an occasional dose of calomel and James' powders, or an enema daily; also attend to the skin, directing sp. mind., or the saline mixture, as the condition of the stomach may admit; also repeat the blisters either for the relief of particular symptoms, or as a general means of removing fever.

7th. In hot climates the bark is resorted to during the remissions. There the septic tendency is so great and the powers of life are so rapidly prostrated, that this practice may be justifiable, and doubtless is proper; but in temperate climates the early use of bark is less necessary, and indeed is generally injurious before an apyrexia is obtained. If, however, the system be greatly debilitated, the milder tonics, as bitters, snake root, chamomile, may be safely employed.

8th. Attend to the air of the apartment and the temperature of your patient. We have remarked that even intermittents, by multiplying their paroxysms, have a tendency to become remittents, and ultimately to end in typhus. So remittents are much more prone to assume the typhoid character, if attention be not paid to personal cleanliness and ventilation; this is not all, they become contagious, especially in apartments where many persons

are crowded together. And in Russel's Aleppo, it is observed, "that intermittent or remittent fevers of the more malignant kind, are seldom seen at Aleppo, unless when imported by persons who have contracted them in other places;" the author thereby clearly denoting their tendency to the continued form and their contagious character. See Russel's Aleppo, Vol. II., page 302, London, 4th edition.

9th. When remittents are unusually obstinate, if possible, remove your patient to the sea shore, i. e. in the hot season of the year; for this change, from a higher to a lower temperature, this new impression upon the system, frequently carries off both heat and fever, as in the remittents of children or diarrhoea infantum. When a crisis is obtained or an intermission only, then administer tonics, especially the bitters and stimulant nourishments; but during the continuance of fever, the diet of the patient should be simple, and then chiefly consisting of vegetable nourishment and dilution, with the least stimulant drinks. The admission of fresh air into the chamber of the sick, and moderate exercise in the open air, then, also will be useful; but if ending in the typhoid form of fever, then the treatment is to be pursued which has already been detailed when speaking on that subject. Allow me here to repeat the observation already expressed in favour of the effects of opiates given to prevent the return of the exacerbations. As in preventing the return of the paroxysms of an intermittent, they in like manner prevent the chill and coldness that announces the returning exacerbations of the remittent. This may be administered in the form of the Dover's powder, or in the following combination, which is in some instances preferable—℞ tinct. opii, sp. ammon. aa ʒi., aq. menth. ʒij. M.; a table-spoonful every two hours, especially before the exacerbation is expected.

INFANTILE REMITTENT FEVER.

To this disease the attention of practitioners was long since directed by the valuable publication of Dr. Butler; and recently by the excellent practical observations on the same subject, by Dr. Colly. The profession has again been called upon to notice this form of fever, which, although of daily occurrence at the bed-side, has not been sufficiently regarded by physicians. In this country, as I was early taught by my preceptors, Drs. Rush

and Kuhn, and as I have witnessed in my own practice since the year 1794, the remittent fever of children is more frequently met with than perhaps any other disease of infancy or childhood, if we except croup, pneumonia, and the diarrhœa, attendant upon teething. Nor is the infantile remittent confined, as observed by Dr. Thomas, to children under six years of age; it is frequently met with between that period and the twelfth year. As in the bilious remittents of adults, it may be remarked of this fever, that it is very generally traceable to derangement of the digestive organs as its primary seat and source. This is evinced by the loss of appetite, the foul tongue, the offensive breath, and the confined state of the belly, in the forming stage of this disease. These symptoms in a few days are succeeded by those of fever, which is of very uncertain duration and violence, and not unfrequently vents itself either upon the chest, producing oppressed respiration and cough resembling pneumonia, or upon the brain, followed by the evidences of phrenitic inflammation, and ultimately terminating in hydrocephalus internus. This last termination, such is the natural tendency and force of the circulation upon the brain at that early period of life, may very generally be anticipated, if active means be not early employed to empty the stomach and intestines, and to unlock the surface of the body by the free use of antimony and other diaphoretics, warm bathing, or by blisters, to create a new and relatively safe seat of irritation upon which the febrile symptoms may vent themselves. Indeed, so constantly is hydrocephalus the sequela of other diseases, that it may, with very few exceptions, be considered as exclusively symptomatic. I have even known pneumonia to be its forerunner.

Teething is frequently productive of fever, ending in phrenitis and hydrocephalus; and I believe, as I have already intimated, the arterial excitement occasioned by the use of mercury, so generally and so indiscriminately given in the diseases of children, has been a prolific parent of this fatal malady, and which has oftentimes been remarked to have greatly increased in frequency and mortality since the very general prescription of that metal. Blackall, Pemberton, and Willan, have all noticed the increase of hydrocephalus since the more general use of mercury.

In as far, therefore, as increased arterial excitement of long continuance, whatever may be its type or its source, has a peculiar tendency to oppress the brain at this period of life, the same

consequence is to be apprehended from the remittent form of fever now under consideration ; and on this account not only calls for the most active means of obtaining a solution of such fever, but in an especial manner suggests the employment of such remedies as are calculated to divert the current from the brain to the other parts of the system. When, therefore, in the progress of fever, the brain begins to manifest irritation by pain or by stupor, blisters to the extremities, and active cathartics, such as an infusion of senna manna, and cream of tartar frequently administered until plentiful evacuations are obtained, are among the most effectual means of arresting the progress of the fatal train of symptoms now to be apprehended. I notice in a particular manner, the infusion of senna, having administered it in many cases of approaching hydrocephalus, and one in which the disease was confirmed, with the most decided advantage. The formula I recommend to your notice, and which I am in the habit of directing, consists of the leaves of senna, cream of tartar, and manna, of each \mathfrak{z} ss. infused in half a pint of boiling water—a wine-glassful every two hours, varying the dose with the age of the child.

LECTURE XXVII.

CONTINUED FEVERS.—SYNOCHA.—CHARACTERISTIC SYMPTOMS.
—TREATMENT.—SYNOCHUS VEL TYPHUS.

THE order of fevers which is next to be considered, is distinguished by having no intermission, nor even a regular remission, or sensible abatement. That is, whatever remission may take place, it wants that regularity of return that we have observed to belong to those fevers which are denominated remittents. Synocha, or inflammatory fever, is of this description. It is so called from the Greek word *συνεχω*, to continue. Synocha, or inflammatory fever, may be said to be a state of pure, general excitement of the system, without local inflammation, and without vitiation of the fluids. When a particular part becomes the principal seat of disease, synochal fever loses itself in one of the phlegmasia, according to the part affected; and when the fluids assume the typhoid type, it also ceases to be the pure, unmixed inflammatory fever which we have now in view. Inflammatory fever commences with a very slight degree of chilliness—sometimes none. We have already observed, with regard to the chill which ushers in fever, that there is a regular grade of chill, from the quartan form of fever, through all the variety of remittent forms, to that of the continued type. That is, the greatest in the quartan, less in the tertian; still less in the quotidian. And again, that it is still diminished in the remittent and continued fevers. Accordingly it happens, that in the plague, in yellow fever, and the various forms of typhus, as in jail, hospital, and ship fever, there is frequently no chill to be perceived whatever. It was also observed, that as the chill and shaking are less, heat and excitement are greater.

2. In inflammatory fever the pulse is quick, strong, and hard. When the fever affects particular parts, as in the local phlegmasia,

especially if seated in the more sensible organs of the body, the pulse is not only frequent and hard, but peculiarly contracted and corded. In typhus fever, again, except in the forming stage, the pulse is small, and oftentimes feeble, and attended with coldness of the extremities, owing to the depressing and deleterious effects of contagion; but in synocha, it is full and hard from the commencement, even though a sense of chilliness be present.

3. Inflammatory fever is attended with hurried, and oftentimes laborious respiration; but not that anxiety that characterises fever from contagion, which primarily affects the nervous system by its deleterious operation. The face is flushed, and the whole surface hot and dry; but in local inflammation, as in enteritis, the face is frequently pale, and the extremities cool. The heat of the system, too, differs from the pungent and peculiar heat of typhus. The eyes also manifest this high excitement. They become loaded with blood, and impatient of light. The impulse of the circulation created upon the head, produces violent headache, and a manifest throbbing of the temporal arteries. And with these symptoms there is also a sense of burning on the brain, which some compare to coals of fire on the head. In some instances, coma, or delirium is the consequence of the force given to the circulation. The urine is high coloured, and diminished in quantity. The bowels are costive; the secretions more or less impaired. The tongue dry and covered with white fur; and upon thrusting it out, the great heat of the body is manifest, even in that organ, by the rapid production of vapour from its surface. This form of fever is but imperfectly described by Dr. Cullen. "*Calor plurimum auctus; pulsus frequens validus et durus; urine rubra; sensorii functiones parum turbetæ.*" And in the last part of it, we (at least in this country) know it to be frequently incorrect, inasmuch as it is oftentimes immediately destructive of the sensorial functions, and thereby proves fatal even in three, four, or five days. Sometimes inflammatory fever appears as a mere ephamera from indigestion. But intemperance in the use of spirituous liquors, exposure to great heat, violent exercise, fatigue, sudden suspension of perspiration, and the other excretions, by exposure to cold; as plunging in the river when heated, or exposure to a shower of rain after labour, upon a warm day, are among the most usual exciting causes of synocha. This form of fever occurs sometimes in cold climates, and in cold seasons of the

year, but then it frequently runs into the local phlegmasia, thereby losing its general character. We see synocha most usually in hot climates, or in hot seasons of temperate climates, and then it most generally attacks such as are of full, sanguineous habits, especially those persons who may have recently changed their climate, by coming from a northern to a southern latitude. The impulse given to such habits of body by the causes which have been enumerated, is not only violent, but soon produces an engorged state of the brain, of the liver, the stomach, the uterus, &c., and if not immediately relieved, the system is broken down by hemorrhages, either from the vessels of the brain, or from the liver, or the intestines. In the torrid zone it assumes a greater malignancy of character, constituting a peculiar form of fever, from the typhoid state of body which it there assumes. This is not all. Under peculiar circumstances it is constituted a contagious disease, and propagates itself by contagion, in this new character, which it puts on in the tropics. Under these circumstances of climate, it is known by the appellation of yellow fever; and as I think has been already shown, it is or is not contagious, depending upon the condition of atmosphere in which it originates, or into which it may be introduced. In our own climate, in the hot seasons of the year, we have also an ardent fever, or *causus*, but which exhibits the symptoms of a pure, unmixed synocha. In the southern states, this indigenous fever is known by the name of the stranger's fever, because strangers to the climate, especially from the north, are most usually the subjects of it; and to them, too, it is frequently fatal in a few days. In the torrid zone, when the heat is above 85° , for a long continuance, the same synocha in the stranger becomes a yellow fever, and ultimately a contagious disease; i. e. in a foul state of the atmosphere, so rendered particularly by concentrated human effluvia. The first is the effect of climate; but its contagiousness depends not merely upon the condition of the patient, but the state of the air surrounding him—if pure, the disease is extinguished in the individual—but if foul, as from confined human effluvia, as on ship-board, in hospitals, in garrisons, in camps, or in confined dwellings of any sort, the disease is communicated to other persons, who may be thus exposed, particularly the full habited stranger from the north. Every summer we have the *causus* or ardent fever in the form of synocha, and if it proves

fatal, ends in local congestions of the brain, the lungs, liver, &c., and in hemorrhages from the stomach, bowels, nose, or some of the organs mentioned. A sort of general sphacelus of the system is the result of this general inflammatory action, which in our climate, may with great propriety, be called pure or simple inflammatory action, compared with the compound character it assumes in the tropics, and which is rendered thus compound by the septic condition of body, the effects of heat, and other causes. Accordingly, we find in our synocha, where it proves fatal, petechae and the yellow skin are rarely produced; but in the tropics, a peculiar state of the fluids is induced, exhibiting great malignancy in their quality, besides the waste of energy, the effects of simple excessive action. Then the humours secreted are peculiarly modified, and by this specific quality become capable of reproducing precisely the same disease in those who may be predisposed to fever—especially the northern man—and indeed, sometimes it is communicated to the native of the tropics; but this is comparatively of rare occurrence. In the northern latitudes, synocha is not usually communicable. I mean that form of it which is engendered here. It is not communicable because that peculiar condition of the fluids, and those peculiar secretions, the effect of it, are not produced. Synocha, with us, breaks down the whole system by simple excessive action, like phlegmon, which ends in the destruction of the part, and simple ulcer is the consequence. But in a hot climate, the phlegmon frequently ends in vitiated and malignant ulcer, spreading fresh inflammation wherever its matter extends. The fever of the tropics, in like manner, terminates in a malignancy of the whole system, which, under the circumstances before mentioned, engenders the pestilence. Even in temperate climates, sometimes, synocha is protracted (but rarely) into typhus or synochus. But this is the effect of other causes, to be hereafter noticed. When the temperature of the atmosphere is as high as 80° , and for a long continuance, the foreigner becomes the subject of ardent fever; and which, too, perhaps proves fatal in a few days, exhibiting many of the characters of yellow fever of the tropics; and, indeed, if his system was in the septic state, as on ship-board is the case with seamen and soldiers, yellow fever would doubtless be the product; i. e. ardent fever with the typhus malignancy of the system superinduced, would constitute the yellow fever, as it

appears in the tropics. But typhus alone is of a different character, and synocha alone is different; but the two being compounded in an athletic habit of body, in a climate where the heat is generally at or above 80° , and in a septic state of the air, yellow fever is not only generated, but is communicated to others, especially to the men of the north, and even sometimes to the native. For these requisites, then, we need not go to Siam, but to any part of the tropics—to the coast of Africa, to the West Indies, or to South America. In this climate, synocha is more simple and pure in its character, except when introduced by contagion. The treatment of it is also simple, for we have but one general indication, which is to reduce the excessive action of the system, duly regarding, however, the habit of body, the season of the year, climate and tendency of the disease.

The means of fulfilling this indication are,

1st. Venesection, general and local, directed by the tone of circulation and strength of the patient's constitution, the dark colour and viscid consistency of the blood, but not the buffy coat.

2d. Open the bowels, especially by the use of saline purgatives, Glauber, Rochelle, sulphate of magnesia, &c.

3. Sudorifics—sp. mind., and antimonials.

4. Cold washing—if no local inflammation exists, and the skin be hot and dry. I have objections to the clay-cap, prescribed for the relief of the pain of the head, and other affections of the brain. The advocates for the constant application of cold washing and the clay-cap forget the function of perspiration, and its office of carrying off the heat of the body, when by their applications they suppress this important discharge from the surface of the body. Instead of constantly covering the head with clay, as is done by some physicians, they may as well extend their prescription by covering the whole body at once with clay, for this will be the consequence of their practice, sooner or later. I have never known it otherwise than a fatal practice.

5th. Warm, or rather tepid bathing, as a means of relaxing the surface by its emollient effects, and for the purpose of conveying off the excessive heat of the body.

6th. Blisters, to convert it into a local inflammation, and for the relief of particular symptoms, as violent headache, delirium.

Diet of the patient.—Bread and water; acid fruits; fresh, do. as oranges, &c.; lemonade; toast-water; cream of tartar; cream

of tartar, with tamarinds; cream of tartar whey; buttermilk whey.

Regimen.—Clothing light, but sufficient to keep the skin relaxed; covered from the air.

SYNOCHUS OR TYPHUS.

The next subject, agreeably to our arrangement, is synochus or typhus, which we consider as one and the same disease, though they are made different genera by Dr. Cullen.

The word typhus, is a term of Greek derivation; it comes from the verb *τυφω*, to inflame.

Dr. Cullen thus defines typhus fever: *Nosology*, p. 71. “*Morbus contagiones; calor parvum auctus; pulsus parvus, debilis, plerumque frequens; urina parvum mutata; sensorii functiones plurimum turbetæ; vires multum imminutæ.*” How far does this correspond with the disease at the bed-side? It differs from it in several particulars. Dr. C. states, that the heat is but little increased in typhus; on the contrary, for the most part, in a certain stage of the disease, the heat is very much increased and much more intense, and a very peculiar biting heat too. It is *acer digitori que urens*: so say the best practical writers, and such is the fact, as you may all daily witness in our hospital and our alms-house. Dr. C. also observes, that the urine is but little changed; on the contrary, it is frequently very turbid, like small beer, especially as the disease advances. With these exceptions, his definition expresses the most prominent features of typhus.

Dr. C. next proceeds to divide the genus typhus into two species, which he denominates typhus mitior, or mild typhus and typhus gravior, that which is more severe and violent. This, in my opinion, is an useless, and indeed an incorrect division. It is making a distinction where there is no difference. He himself admits in a note,* (which frequently, as I have said before, is at variance with his text,) that it is wrong to distinguish diseases by different names, that differ only in degree. His expression is “*morbos gradu solum differentes, nominibus diversis insignire, nequequam convenit;*” and he further subjoins, that he has not perhaps arranged them accurately, as the limits are by no means settled. “*In hac re autem, cum*

* See *Nosologia Method.* p. 71.

limites neutiquam accurate ponere disunt me accuratum fuisse non dixerim." Under the one species, viz. the mitior, he professes to place the milder form, called nervous fever! and under the latter species, the gravior he wishes to be considered as placing putrid fever, that is, where the humours more particularly show a diseased or putrid state.

Still again in his notes, he unfortunately adds, that in every species of typhus, he thinks there is a tendency in the humours to putrefaction. "In omni typho humorum in putredinem proclivitatem adesse puto." A very strong expression certainly, of his opinion on the state of the fluids, in fevers; and it is to be regretted that in his first lines he had not given less attention to the nerves and more to the fluids.

There is certainly, as you must perceive, and as Dr. C. himself in so many words admits, no foundation for these distinctions of typhus: they only serve to embarrass without leading to any possible good, either as it regards the nature of the disease or its treatment; for every nervous fever is attended with a putrescent state of the fluids; and every putrid fever is attended with a deranged state of the nervous system; and this too is the case, whether this typhus state be the effect of long continued action producing the morbid state of the fluids, or it be produced by a taint introduced into the system, the produce of other diseased bodies.

But strange to tell, Dr. Cullen with all his scruples of conscience, relative to the distinctions we have noticed, is not even contented with those two forms of typhus, and has accordingly constituted another genus; another twin brother of typhus, which he calls synochus!! This he defines to be, "*morbis contagiosus, febris ex synocha et typo composita, initio synocha progressu et versus finem typhus!!*" A contagious disease, compounded of synocha and typhus, first synocha, afterwards as it proceeds, and towards its termination, a typhus. But, let us ask, is he himself satisfied with this new genus, as distinct from typhus?

Let us again look, for I have already said that Dr. Cullen, in his notes, deposits all his doubts of the correctness of his text, and indeed he frequently here gives us more truth than he does in his text. Here again, in a note, he candidly observes, that between typhus and synochus, he is unable to ascertain the exact

limits, and is in doubt whether they are really different genera, or if different, to which of them the synonyms of authors apply. The following is his own language :

“*Inter typhum tamen et synochum limites accuratos ponere non possum ; et an reverà pro diversis generibus habenda, vel positis diversis, utriusque synonyma auctorum referenda sunt dubito.*” A very honest doubt ; and if he doubts, we surely may be permitted to doubt the correctness of his distinction, as he admits himself, that it is a distinction in which he cannot find the difference. You will therefore, gentlemen, not be surprised that I have made these* two genera of Dr. Cullen, one and the same, calling them typhus or synochus, for neither we nor Dr. Cullen himself, can distinguish between them. On this subject we have already been so free, that I have few observations to make at this time, and these will be very short.

Typhus or synochus we remark, is very generally more or less inflammatory in its first stage : i. e. when the poison creating the disease, first acts on the system ; whether gendered within it or introduced from without, it excites irritation, manifesting that stage of the disease which may properly be denominated the inflammatory stage, or the stage of remittent ; that is, it is synocha in its commencement, though it is typhus in its progress and its termination. Armstrong too, takes this view of this subject. The symptoms, as it affects the brain, nerves, heart, arteries, exhalents and the excretions, the absorbents and the fluids of the system, have all been very fully detailed.

The causes also of this form of fever have been particularly

* Dr. Dumar, I observe too, in a late publication, refuses to admit Dr. Cullen's distinction between typhus and synochus. The following is Dr. Dumar's observations :

“I have not used Dr. Cullen's distinction of synochus and typhus ; because I do not believe that the distinction exists in nature. I have never seen an instance of typhus fever according to his definition. “All our severe fevers begin with excitement and terminate in debility, or are instances of synochus ; although in truth, they are the identical diseases from which Dr. Cullen drew his description of typhus ; and are genuine examples of the only typhus fever which exists.”

Dr. Cullen's system, says Dr. Good, like himself, is a work of no ordinary stamp ; it is full of immortality, but mixed up with weak and perishable materials. —Good, vol. ii. p. 119.

enumerated, viz. marsh effluvia, under peculiar circumstances ; confined human effluvia, decomposed animal matter, salt provisions, want of fresh vegetables, &c. and contagion.

Of the first, we have seen examples at the Walkill, in the newly cleared grounds of our southern states, and in the wet marshy grounds of Walcheren, in the island of New Zealand.

The typhus of Great Britain, which occurs in their large cities, and in their manufacturing towns, are the products of confined human effluvia, the results of the filthy mode of living, unavoidable among the poor, where the resources of life are so scanty, compared with their population. Ship and jail fever are of the same description, only assuming if possible, a still greater degree of malignancy, as we have seen exemplified on board of the Irish ships which have been employed in bringing the sons of St. Patrick to this country. And that typhus or synochus is also produced by contagion, as well as gendered by the causes we have enumerated, I trust is admitted by all who are practically acquainted with disease. Closet physicians may speculate about it, and because they cannot comprehend the why and wherefore, cut the knot by denying the existence of contagion in toto. But, while the works of Huxham, Lind, Blane, Pringle, Rush, Saunders, McGregor, Gregory, Home, Cullen, Lempriere, Fordyce, Cleghorn, Chisholm, Heygarth, and Armstrong remain, the positive testimony which they give you on this subject, is not to be affected or overturned by the breath of speculation, or the airy nothings of imagination.

I may indeed refer you, *passim*, to every practical writer, whether at home or abroad, for the evidence of the contagious character of continued fever under the peculiar circumstances which have been enumerated ; the hospitals of London, of Edinburgh, of Aberdeen, furnish to their pupils continued examples on this subject ; and it is to be regretted, that some of their American pupils had not spent their time more profitably, and brought with them to this country, more correct knowledge of this subject, more facts and fewer speculative opinions.

We see it, according to Drs. Young and Gordon, even communicated to the lying-in women, giving even to puerperal fever this contagious character, not ordinarily attached to that disease. Nor is it confined merely to fevers and other diseases of the whole system ; but this state of the air influences the character of many

local diseases—hence indeed has arisen the peculiar form of ulcer, called hospital ulcer, noticed by practical writers. “Every ulcer,” says that accurate observer, Dr. Blane, “acquires peculiar malignancy when such a state of the air taints the bodies of those who labour under them.”

But we need not go from home for illustration, we see it in our public institutions, and occasionally in our private families. In my own family, in the present winter, I have witnessed the introduction of this disease by contagion; this fact alone, must confound all who could have before entertained a doubt on this subject. The most malignant form of typhus fever, as it prevailed among the soldiers stationed in the neighbourhood of this city, was introduced into my family by a son of one of my servant women. I could not send him from my house to deprive him of his mother’s services during his sickness: the consequence was, that my children, who frequently went to his room, took the disease from him, and they had nearly perished with it. And in all, it put on the same character, the same malignant form of typhus, attended with all those effects of the nervous system, and the vitiation of the fluids and broken texture of the solids that have been noticed, bleeding gums, bleeding blisters, blood boils, and unceasing delirium. I still look back with horror at the destruction I had nearly witnessed, by the visitation of that disease, and cannot but cherish the strongest feelings of gratitude for the preservation of my children on that distressing occasion.

The indications of cure in this form of disease, and the means of fulfilling them, have been also minutely pointed out, as consisting, in the first stage, of the means of reducing the excitement produced, at the same time keeping in view the termination of the disease, and the debility which ensues. We have especially pointed out the use of venesection, emetics, cathartics, sudorifics, and the alterative treatment, to prevent the poison from wasting the system by its action, i. e. by counteracting, by means of evacuations, the irritation it occasions, until the poison creating the disease, shall itself be worn out, and the putrescent state of the system be removed. This is an important idea to be kept in view, and that our remedies be so directed, that thereby the poison of the disease should do the system as little harm as possible.

In the treatment of the second stage, our attention has been

directed to the means of counteracting the debility induced in the solids, and the diseased condition of the fluids.

Stimulants and tonics, both in the form of medicine and diet, have been particularly directed for the first of these objects ; while the most powerful antiseptics which the materia medica or our food can furnish, and other means of counteracting the putrescent state of body, including the use of external applications, ventilation, and other means of purifying the air, &c., have all been so minutely detailed, as, I trust, to make any further observations at this time wholly superfluous.

LECTURE XXVIII.

DYSENTERY.

DYSENTERY being a disease of frequent occurrence, and being always attended with danger, is highly important. It is especially important during war, when the disease usually assumes a contagious character, and, superadded to the danger to the individual, is that of communicating it to others. The term is derived from *δύς*, difficult, and *εντερον*, intestine; thereby denoting a deranged state, more immediately, of the intestines.

Dr. Cullen has very properly defined dysentery to be "*Pyrexia contagiosa; dejectiones frequentes, mucosæ, vel sanguinolentæ, retentis plerumque fœcibus alvinis; tormina; tenesmus:*" a contagious fever, attended with frequent mucous or bloody stools, (or rather, he should have said, with frequent efforts to go to stool, and then very inconsiderable discharges.) "*The fœces,*" he adds, "*are for the most part retained, attended with gripes and tenesmus.*" By *tenesmus* is meant a straining and frequent inclinations, but unsuccessful efforts to discharge the contents of the bowels.

From the bloody discharges attendant upon dysentery, it is commonly known by the vulgar name of the bloody-flux. As I formerly observed, Dr. Cullen has strangely placed it among his profluvia; whereas it is most frequently the very reverse of profluvia, being most usually attended with diminished instead of increased discharges. Remember, I refer more particularly to epidemic dysentery, not only because it is a highly contagious disease, but also to distinguish it from that local affection of the bowels, consequent upon diarrhœa, or the effect of mere local irritation in the intestines, such as is occasioned by aloes, or mer-

cury, or teething, and which is unaccompanied by the typhoid form of fever, that characterises this disease. In the disease referred to, under the appellation of dysentery, I mean the dysentery of camps, as described by authors—the “*febris introversa*” of Sydenham, and which is not merely a disease of the intestines, but a disease of the whole system. The circumstances under which it occurs, the causes which give rise to it, the character of the fever attendant upon it, the season of the year at which it most generally appears, have all induced me to place it among the continued fevers. In other words, to consider it as a disease of the whole system, and not as a mere local affection of the bowels. The treatment, too, which is founded upon this view of the disease, is more likely to be successful. Otherwise our attention may be directed to the bowels alone, while the state of the whole system is neglected, and the disease is thereby rendered fatal by those circumstances, having overlooked forms which give it malignancy, and render it a dangerous disease.

Dysentery, for the most part, occurs in summer and autumn; that is, about the same time with intermittent, remitting, and typhus fevers; and sometimes proceeds from the same causes. According to Huxham, it has occurred as an epidemic in the spring, and it has also continued through the winter; but winter generally checks its progress, as it does the plague and yellow fever. Pure dysentery never assumes the intermittent or remittent forms of fever, but always the typhoid, except when complicated with them. Even in the same ship, in some instances, the two different diseases have been known to exist at the same time, without the one yielding to the other. A case is related by Dr. Blane, where two ships’ crews were mixed—the one was affected with dysentery, the other with fever. In another place he observes, that even two different persons, owing to constitution, will be attacked, one with fever, the other with dysentery. Dr. Harty, however, is of opinion that dysentery is contagious only when combined with typhus fever; and that its contagiousness is only derived from the fever accompanying it. It is true that dysentery is only contagious *sub modo*, depending on the state of the surrounding air. In private families it is not always contagious, owing to cleanliness, state of the air, &c.; but in an impure air, both the disease itself is rendered more malignant, the secretions acquire additional virulence, while the air itself is peculiarly fit-

ted as the vehicle of conveying, or rather of multiplying the contagion effused from the diseased body.

Zimmerman justly ascribes to this cause alone its contagiousness: "Hence," says he, "it prevails among the lower ranks, where their houses and their persons are filthy;" and observes, "that it is only infectious as cleanliness is disregarded." But although filth may generate it, and give malignancy to the disease, a specific contagion will, in some cases, propagate it, even where cleanliness is observed, and in the pure air, too, of the country. This was remarkably the case in two families, some years since, in the country, on Long Island. The same fact has been remarked of yellow fever, jail fever, and other contagious diseases. That they acquire such malignancy that the disease is communicated from individual to individual, independently of the state of the air. This, however, is not usually the case; but these facts are important as they demonstrate the specific character of those diseases, and the communication of them by a specific material. Others consider the peculiar mucous discharge, which takes place from the bowels, as the only contagious matter or vehicle of the disease! This is but one of the media of communication. In other contagious fevers, the various excretions of the bowels, the skin, and the lungs, all communicate the specific poison of disease. Dysentery also appears more frequently in warm than in cold climates, especially in persons going from a northern to a southern latitude; and more particularly those who add to their septic habit of body by living principally upon animal food, as is the case on ship-board, especially transports. The same thing is observed of malignant fevers in general. Hence dysentery, as well as those fevers, are so prevalent in hot latitudes, as in the West Indies, the East Indies, in South America and Africa. Dysentery appears also during and after wet seasons, in those climates, especially when the rains succeed to great heat, and the body is consequently in a septic state—the perspiration being then suddenly checked, the bowels are immediately affected. The febrile affection, that is produced in this state of the system, and in the condition of the intestinal canal that is occasioned by the excessive use of animal food, the accumulation of human effluvia, and the want of fresh vegetables, is immediately turned in upon the intestines, which become the chief seat of its irritation; hence very properly called by Sydenham, "*febris introversa*," or fever

turned in upon the intestines. "This disease," says Pringle, "is always most numerous and worse after hot and close summers, especially in fixed camps, or when the men lay wet after a march in warm weather." Bontius, too, remarks that the hottest weather produces that disease when the nights begin to be cold. Upon the same principle, dysentery also frequently occurs in the hot seasons of temperate climates, as well as in the hot latitudes which have been noticed. An impure atmosphere, rendered so by many persons being crowded together in small apartments, as on ship-board, both predisposes to, and in some cases, gives rise to dysentery, especially in conjunction with the use of salted or putrid provisions: for, as before remarked, the excessive use of animal food, and the want of fresh vegetables, has great agency in inducing this peculiar condition of the intestinal canal, necessary to constitute dysentery. Putrid effluvia, i. e. exhalations from putrid animal matter, are also among the exciting sources of dysentery. Dr. Donald Monro says, it is always produced by obstructed perspiration, and exposure to putrid effluvia. (See my letters to Dr. Currie, stating the cases of dysentery occasioned in 1798, by the effluvia of putrid beef.) Thirty-eight of forty persons engaged in removing and unpacking putrid beef, were attacked with dysentery, at the very time, too, that yellow fever prevailed in part of the city. Subsequently it was introduced in the neighbourhood of this putrid atmosphere, and produced the most deadly effects, extending itself as far as that foul atmosphere extended.

Marshy and moist situations are among the causes of dysentery. They not only act by the vapours arising from decomposed animal and vegetable matters, abounding in such situations, but also by the cold which such moisture produces, and the check of perspiration which is thereby occasioned. "Accordingly" says Pringle, "armies thus encamped rarely escape."

Cold is another powerful exciting cause of dysentery; "especially," says Lind, "the alternate action of heat and cold." Dr. Blane remarks, "that exposure to cold produced dysentery in a vessel that had been perfectly healthy, and where the greatest cleanliness had been observed. Upon leaving New York," he adds, "the first cold weather induced a dysentery, which cut off sixteen of the crew."

When dysentery may have been generated by any of the causes which have been enumerated, it is afterwards propagated by a

specific contagion. I say, a specific contagion, because precisely the same disease is reproduced, with all its peculiarities. The same peculiar affection of the bowels, and the same character of fever are the consequences. Whereas, obstructed perspiration alone would produce, under other circumstances, diarrhœa, or cholera morbus, or some of the phlegmasia; or, if the contagion was in the system, such check of perspiration would be an exciting cause of dysentery; but contagion alone produces dysentery, and few other diseases prevail when dysentery appears. Like other contagious epidemics, it generally takes the command and makes all other diseases obey; and it is reproduced in all with precisely the same kind of symptoms; that is, in all who are predisposed to receive it; for in some it is more easily lighted up than others, as a man, labouring under dysentery, introduced on board ship, will spread the disease through a whole crew, because that crew, by their habits of living and vitiated state of body, are rendered very susceptible both of the typhoid form of fever, and the irritation of the bowels peculiar to dysentery. This was the case, according to Dr. Blane, in the Torbay ship-of-war, in August, 1780. "The crew," he states, "were predisposed to acute distempers, as was to be expected at that season of the year; and a great number of them being crowded together, as is usual in ships of war. In this state of things a man was brought on board, ill of dysentery. Dysentery," says Dr. Blane, "became the prevailing disease.* But again," says Dr. Blane, "if instead of a dysentery any other fever had been introduced, such fever would have been the prevailing disorder." Different habits of life, and consequently different habits of body, have their influence in determining the character of a disease; the contagion of typhus fever being introduced among puerperal women, puerperal fever, with all its characteristic symptoms, is the result. In like manner, owing to a peculiar diet, in connexion with bad air, a predisposition may exist in the intestines to dysentery; while in others, not thus prepared, the same typhus taint will not produce dysentery, but typhus fever. This fact is stated to have occurred in a ship employed as a transport ship from England to New South Wales. The crew of the ship were ill of fevers; meaning ordinary typhus, or ship fever. But the convicts whom

* Dysentery of Seamen, p. 449.

they had received from prison, became the subjects of fluxes; i. e. dysentery, owing to something peculiar in their habits, predisposing to dysentery.—(See Blane, p. 449.) These two diseases, therefore, it appears, are in some cases vicarious, depending on particular circumstances or accident, though arising from the same causes. Weak and exhausted habits are most susceptible of this disease. Fatigue, vexation, and fear, peculiarly prepare the body to become affected by dysentery as by other contagions; and hence tonics frequently are the means of preventing it in this, as in others. (See Sir George Baker's *Treatise de Dysenteria*.) Not only so, but these causes render it more violent in degree. The same fact is observed of the contagion of small-pox. The debilitating preparation, formerly fashionable, as preparatory to inoculation, almost invariably rendered the disease more virulent than it would otherwise have proved. (Example of Dr. Cochrane's, the Surgeon General, of want of medicine to prepare the American troops for inoculation, during the revolutionary war, when stationed near New Brunswick. They all had the disease in so mild a form that the fact was notorious. See Thacher's *Military Journal*.)

Contagion itself, is only in some cases a predisposing cause of dysentery, while cold, fatigue, intemperance, or other occasional causes, shall excite it into action; as we have seen to be the case with intermitting and remitting fevers. But when dysentery is once generated, contagion in that case becomes the chief exciting cause. This is communicated, most commonly, though, as said before, not exclusively by the excrements, by moving of public privies, or by neglect of cleanliness in retaining the excretions in the apartments of the sick. Infected clothes are also oftentimes the vehicle of the contagion, and from which not only the wearer but those who come near, receive the infection. In some instances, according to Dagner's history of the disease, it has been as epidemic as the plague; "but it is generally true," says Sir John Pringle, "that the infection spreads more slowly than most epidemics."

Dagner again observes that dysentery is not less infectious than the plague itself, (this, however, is somewhat questionable,) and that, like many other contagious diseases, it is oftentimes communicated to the foetus in utero. Women thus situated, frequently, however, escape, as in the example of Mrs. Miller, and

women in the Hospital, mentioned to you some time since, who went on to her full time and bore a living and healthy child. But the most common of the exciting causes of dysentery, is the check of perspiration by cold in those who are prepared for the disease. Zimmerman accordingly observes, and which is in correspondence with this fact, that warm drinks and perspiration, with a moderate quantity of food, (which, by the by, he should have restricted to vegetable food,) and temperance as to liquors, are among the most effectual means of prevention, and, that they render the disease mild when its subjects are attacked. Wilson enumerates among the causes of dysentery, an unusual quantity of bile, and that of a dark colour, implying, says he, a vitiated state of that secretion. This, too, he remarks, is confirmed by the disease spreading where this is the case. But it is very plain that Wilson does not understand the connection that exists between dysentery and the state of the biliary secretion. This obstruction of the bile is doubtless the consequence of bad diet, that is, of an undue proportion of animal and salted provisions, or perhaps of the extensive uses of them and the want of fresh vegetables; for as I have observed to you when speaking of the nature of diet, it is the effect of fresh ascendent vegetables and acid fruits, to promote the secretion of bile (as butchers tell us too, is the case with cattle living on grass instead of hay,) and of the want of them to diminish the secretion. This obstruction then proves an aggravation of the disease by retarding the peristaltic motion of the intestines, and thereby promoting the putrefaction of the contents of the intestines. It is also ascertained that bile present in the intestines has a directly antiseptic operation upon the contents. In that case its absence may assist us in accounting for the more rapid putrefaction and more virulent condition of its contents.—(See Wilson's Treatise.) We now come to the symptoms of this disease. The other characteristic symptoms of dysentery are well marked in the definition given of it by Dr. Cullen. Notwithstanding his objections to the humoral pathology, he admits the putrefaction of the fluids and the contagiousness of diseases which derive their character from the circulating fluids and the excretions which take place from those fluids. And especially making the contagiousness of the disease an essential part of it; for it is of all things an essential character of dysentary under the circumstances favourable to the propagation of

contagious fevers in general, and ought always to be kept in view by the physician, and that too, whether the disease appears in the camp or the private family. Not so, says Wilson, adding that this part of Dr. Cullen's definition, calling it a contagious pyrexia, might be dispensed with altogether. Let me remark to you, gentlemen, that you will find Wilson's chapter on this subject a very heterogeneous one, and that the author has no correct view either of the nature of the disease or the treatment of it. He has merely strung together his remarks from the writings of others, and those not the best, without, as I believe, having himself, the least practical knowledge of dysentery. He never had that opportunity. I knew him well as my fellow student, and know his pursuits to be those of the closet, not the practical physician. His indications of cure, to be sure, would lead you at first view to suppose he had carefully examined the subject, for he very soberly makes two indications—but what are they? viz. to procure the evacuation of natural fœces, and as soon as this is accomplished, to restore tone to the bowels. A very local view indeed, and such, as in my opinion, shows his total want of essential acquaintance with this subject. But Dr. Cullen's, you will find to be little better, for he makes spasmodic constriction of the bowels the proximate cause, and of course antispasmodics the chief remedies! Wilson, too, as you will find, evidently compounds the local irritation consequent on diarrhœa with the dysentery of camps. It is important then for us to attend to the symptoms of dysentery, that we may arrive at some general deductions relative to its nature, and that from thence we may obtain correct principles to guide us in its treatment. It may be remarked that dysentery appears in two shapes, that is, as it regards the part of the body first affected. When it is generated in the individual, the first symptoms of the disease manifest themselves in the bowels, producing pains, tenesmus, and consequently a febrile state of the whole system. But when it is the effect of contagion the whole system manifests its operation, and soon after the bowels, that is, exhibiting at first all the symptoms attendant upon the invasion of typhus fever, viz: chill, heat, thirst, a dry skin, and, in a short time, these are succeeded by irritations of the bowels, to which the subject is peculiarly predisposed by the circumstances under which dysentery usually appears. Wilson says that the fever of dysentery is sometimes a

synocha throughout the greater part of its course. Dawson, too, in his nosology, expresses the same views. He, however, admits that it is more frequently of the typhus form, and that when this is the case the danger is very great. This, I would remark, is very true in every case of real dysentery—not that form of it which he states to begin with diarrhœa, which he says is often the case. From this assertion alone, I should suppose Wilson had never seen a case of genuine dysentery. On the contrary, so far from diarrhœa, it begins by the want of evacuations or rather frequent efforts, but attended with very small and very inconsiderable discharges. Another circumstance which would lead us to distrust his views on this subject, is his observation, that dysentery is sometimes a disease of many months duration. On the contrary, being a very severe and an acute disease, it is necessarily a disease of but few days continuance. It is evident then that Wilson has confounded a mere morbid sensibility of the bowels, the consequence of diarrhœa or dysentery, with dysentery itself. In the first place then, the symptoms of dysentery are the symptoms of general fevers of the typhus type, manifesting considerable irritation of the nervous system, viz: chill, nausea, vomiting, frequent pulse, which is sometimes weak early in the disease, as after other species of contagion. This, however, is not oftentimes the case in the commencement, for generally the excitement of the arterial system is very manifest; but dysentery never exhibits the symptoms of typhus fever alone, as Wilson asserts, without an affection, or the usual irritation of the bowels, for these very soon succeed. Where they appear late, Wilson calls it a complication of typhus and dysentery! I assert that true dysentery is always of the typhoid tendency and character; and that, whether generated within or introduced by contagion. Nor do the general or constitutional symptoms depend on the local, as Wilson states, (p. 414.) On the contrary, both the general and the local irritation are to be considered as essential to true dysentery. Blane, however, is of opinion that the affection of the bowels is only symptomatic. But were this the case, we should see few cases of typhus fever without the local symptoms attendant upon dysentery. In addition then, to the general symptoms of typhus fever, this disease is attended with pain in the bowels, and which, as in enteritis, is increased upon pressure. This pain appears sometimes about the

navel, affecting chiefly the small intestines which occupy that part of the abdomen. Most usually, however, it affects the stomach, and the part of the colon passing in its vicinity, attended with irritation in the rectum and anus. Not, however, confining itself to the anus, but extending to the hips and through the pelvis. In some instances, Cleghorn observes, that the pain extends to the ribs and lungs, resembling the pains of pleurisy, extending from one hypochondrium to the other. This will remind you of my observations in the case of the bilious accumulation in Beekman street, resembling enteritis; and that the same cause in other cases exhibits the symptoms of pleuritic inflammation. Another remark of Pringle, and other practical writers, deserves your attention; that when pain and griping exist without much nausea, it is an indication that the large intestines are the seat of the disease; and on the other hand, that when there is more sickness than griping, and the irritation is higher, the disease is probably seated in the small intestines—so says Pringle. But you will perceive that this distinction must in some respects be equivocal, depending very much on the sensibility of the nervous system in the individual labouring under the disease. And in most cases, too, let it be remarked as a fact, that the disease is preceded by indigestion, showing itself in nausea, flatulence and eructations, which are to be expected from the costiveness constituting the commencement of the disease; but the lower part of the intestines becomes the chief seat of its irritations, for there the cause of the disease operates with more force, for there is the greater malignancy of the contents of the bowels. The consequences are inflammation, followed by mucous and bloody discharges, and sometimes, says Sydenham, no stools at all. It is important for you carefully to distinguish between the mucous and bloody stools of real dysentery and those attendant upon diarrhœa, or which succeed to the use of mercury, or the bloody evacuations occasioned by hemorrhoids, and in children by teething. In some cases, too, of dysentery we meet with evacuations of mucous without blood; but this is of so rare occurrence as to afford no foundation for the distinction which has been proposed, into mucous and bloody dysentery. When stools consisting of fœces are procured by art, in this disease, they consist of small dry, circumscribed, globular masses, denominated scybala. How are these formed? By the irritation occasioned by the con-

tents of the bowels producing a spasmodic constriction of the intestines, particularly the colon. The same irritation, too, excites the absorbents in common with the other parts of the vascular system, and occasions the more fluid contents of the bowels to be absorbed, leaving the remains hard and dry, and moulded in the cells of the colon. In this manner these scybala are formed, while the materials absorbed vitiate the whole mass and aggravate the character of the disease; and where the disease proves fatal, the intestines being examined after death, are frequently found contracted, even in some cases, to three-quarters of an inch diameter!—the coats thickened exhibiting ulcers and other evidences of inflammation.*

* See Baillie's *Morbid Anatomy*, pp. 67—71—73.

LECTURE XXIX.

DYSENTERY.

HAVING noticed some of the symptoms of dysentery, and showed you some of the plates of Dr. Baillie, exhibiting the ulcerations and changes which the intestines undergo from the inflammation attendant upon that disease, I go on to remark, that in most cases of genuine dysentery, the discharge from the intestines appears of a mucous and viscid nature, resembling the scrapings of guts, or those portions of fatty matter which are separated in cleaning the intestines of animals. The thinner parts of the mucus, the natural lining of the intestines, are absorbed, and the more viscid remains are forced off by the tenesmus attendant on this disease; but sometimes the inflammation of the intestines produces, as in other membranes of the body when inflamed, an excretion of matter, which exhibits a membranous appearance, and which is effused on the surface of the inflamed gut. We see this process exemplified in the inflammation of the trachea and pleura, the dura mater, and the intestines in enteritis, in strangulated hernia, in the excitement of the uterus, producing the appearance of membranes, and in that of the ovum, leading to the same deception. See Hunter.

We see the same in the inflammation attendant upon dysentery. By many, this apparently membranous production, the effect of inflammation, is considered as the villous coat of the intestines thrown off. Not so: this cannot be, except after sphacelus—which sphacelus must be preceded by purulent discharges, the effect of high inflammation. In those cases, ulcers after death, are ob-

served to have been the attendants upon such separations of the intestinal coat; but this apparently membranous matter, which is discharged in dysentery, is frequently thrown off, when no ulceration has taken place in the bowels, as has been ascertained by examination of the body after death. This fact is particularly stated by Zimmerman.

Dissections too, show the inflammation of the bowels, which terminates in ulceration and in sphacelus, are altogether distinct from the former. The inflammation has been sometimes found to extend even to the stomach, which too, partakes of the gangrenous or dark colour; the coats of the intestines have been found thickened, the villous coat in some cases entirely consumed, and the vascular in that case is usually found, loaded with distended vessels, and covered with a bloody sanies or slime. The large intestines are more frequently found sphacelated and ulcerated than the small. Why? Because they are the residence of those more acrid materials which enter into the nature of dysentery. Inflammation in that part of the intestinal canal is necessarily the consequence.

Sometimes too, according to Cleghorn, ulcers are found upon the outside of the intestines as well as internally, thereby showing that the whole texture of the bowels is involved in the inflammation; not only the mucous lining or tissue, but all the tissues inside and outside, muscular and peritoneal, as well as the inner mucous lining. In some, again, small abscesses were formed in the cellular membrane of the peritoneum, contiguous to the colon and rectum. In others, the convolutions of the intestines were found adhering to each other and to the neighbouring parts, as in enteritis. Purulent matter has also been found floating in the cavity of the abdomen, and in two cases related by Dr. Cleghorn, the omentum was almost wasted by the absorption of its fat; but in other instances, the omentum has been known to remain loaded with fat, while the intestines had rapidly run on to gangrene. In some again, small, flat tubercles, like the flat pustules of confluent small-pox, are found in the intestines. Pringle, Cleghorn, and Hewson, have all noticed these appearances; and Linnæus has also described what he calls scabies of the intestines, that he has found in dysentery, and which is probably the same appearance.

Zimmerman too, notices flat aphthæ on the intestines, yielding pus like the flat pustules of small-pox ; he also remarks, (see Wilson, p. 421,) that the mesenteric glands were found swelled, inflamed, and containing a bad kind of pus. Cleghorn also describes scirrhus tubercles, as found after death, in addition to the inflammation and mortification, which are the attendants upon dysentery. It is remarked by some writers, that in cases where much blood has been discharged during the disease, upon examining the body after death, it frequently happens that no ulceration is to be perceived, that is, the local inflammation has been removed by such discharge. From this fact, Sir John Pringle and Zimmerman have concluded, that the discharge of blood is the effect of the typhoid state of the system and the consequent relaxation of the vessels, and not the effect of ulcerations or the mere local constriction of parts. The truth probably is, that both the local and general disease, are concerned in the production of this as well as most of the malignant symptoms of dysentery. The gall bladder has oftentimes been found much distended with bile, and that of a darker colour than is natural, as has been remarked by Cleghorn. This fact shows the want of fresh bile, the stricture upon this excretion, and the confined and slow state of the bowels, the effect of this diminution of the biliary discharge.

Pringle has also given an account of the appearances which he met with upon dissection. "Upon opening the body," he observes, "even the day after death, the fœtor of the gas extricated from the body, was intolerable ; the intestines were wholly mortified, and the stomach partly so ; the very coat of the liver was affected, and abscesses had formed in the substance of the liver itself, containing purulent and ichorous matter." The spleen, he remarks, was likewise found affected by the disease. The thoracic viscera generally escape, but a case is related by Morgagni in his 31st Epist., in which the lungs themselves were found very much diseased. Hence then, we see that death is not only occasioned by the general febrile state of the system, but also by the inflammation which affects the intestines.

That we may be enabled to form a correct prognosis, let us recount the favourable and unfavourable symptoms of this disease. The favourable symptoms are,

1. Natural stools procured—of proper odour and consistency.
2. The fever being diminished, the skin becoming moist and of its natural temperature, the tongue clean.

3. Pain removed, or only returning occasionally. When suddenly removed, beware of consequences; i. e. if the sudden disappearance of pain takes place, attended with cold extremities; not so when the extremities are warm. But it should be remarked that tenesmus sometimes continues from the remaining increased sensibility, though the disease itself be chiefly removed; and indeed sometimes a permanent irritability and even strictures, have been the consequences.

Prolapsus ani has also been the result of this disease, when the debility of the system has been great, and the tenesmus more than ordinarily troublesome.

The unfavourable symptoms are,

1. Aphthæ in the mouth, is a fatal symptom in general; for it denotes an inflammation of the intestinal coat.

2. Strictures of the intestinal canal throughout.

3. Discharges from the bowels of a bloody water; like the washings of meat, hence called *lotura carniū*; not always fatal.

4. Cold extremities, and a livid appearance of the body.

5. Stercoracious vomiting.

6. Tympanites—a fatal symptom; sometimes vibices.

7. Carbuncles, as in the plague; black tubercles.

Our duty now will not consist merely in procuring the evacuation of natural fœces, and then giving tone to the system as enjoined in the indications proposed by Dr. Wilson. Nor is our indication that of Dr. Cullen, merely to counteract spasm. For in that case opium, which is our most powerful antispasmodic, would be our remedy; on the contrary, in the first stage of dysentery, opium is one of the most injurious and dangerous medicines that can be prescribed. It reminds me of Dr. Underwood's prescription of *assafoetida* in the cure of another dangerous and highly inflammatory disease, the croup. It is a mere palliative of a particular symptom, having no regard to the cause or leading character of the disease.

From what we have seen of this disease, as it appears in the whole system and in the bowels, more immediately the seat of its ravages, we are led to believe that the proximate cause of

dysentery consists in a febrile irritation of the typhoid type of the whole system, accompanied with inflammation and irritation of the intestinal canal, which inflammation is more especially seated in the colon and rectum. As the proximate cause is of a two-fold character, and as the affection of the intestines is more immediately dangerous than the general fever, and the local irritation, than the typhoid state of the system, our indications of cure will also be two-fold, not only to counteract the febrile irritation of the whole system, but our attention will also be especially directed to the removal of the sources of the irritation which exists in the intestines. This irritation consists in inflammation, accompanied with violent spasmodic constrictions of the intestines, and threatening sphacelus, a frequent consequence of inflammation when seated in organs of great sensibility.

This inflammation too, is rendered peculiarly dangerous, from the materials creating it in the bowels, and those aggravating it arising from the state of the whole system. On this account then, let your first attention be directed to the removal of the inflammatory and other alarming symptoms affecting the bowels. And fortunately, the same means which are calculated to accomplish this object, are also among the best remedies we can employ to remove the febrile excitement of the whole system; but you have here occasion, gentlemen, for the best judgment you can form in the treatment of this first stage of the disease. You have a typhoid enteritis to contend with, and it agrees to typhoid peripneumony, or a typhoid inflammation of the throat, or the typhoid puerperal fever.

You have enteritis on the one hand, which calls for active remedies to remove the inflammation; on the other, the whole system is threatened with typhus fever, the usual form of fever attendant upon dysentery, in which antiphlogistic remedies are to be employed with the greatest caution. A middle course is therefore to be pursued, especially if called upon in the first days of the disease, before the strength of the system is much reduced. Sydenham and Lieutaud begin the cure of dysentery with venesection. See Parr. Dictionary. Akenside recommends it, but to be done with caution.

Dr. D. Monro has also given us a good rule on this subject: "where the pulse is feeble, be sparing of the vital fluid." Where the habit is full—the subject young and athletic, vene-

section is certainly not only admissible, but called for in dysentery; otherwise sphacelus, in such state of body, may be readily induced; and if possible, this remedy when made use of, should be employed before the third day of the disease, otherwise it will be generally more dangerous than useful. But in a delicate habit of body, depressed by the action of the poison on the system, the pulse small, feeble, and not indicating high inflammatory excitement, avoid the lancet, and trust to the other less debilitating means of removing inflammation. Leeches, in such cases, may remove the local inflammation. After you have reduced the excitement by venesection or leeches, when this remedy has been indicated, our next attention should be given to the different secretions of the system. The biliary discharges we have observed, are interrupted, and perhaps the gall bladder loaded with a dark acrid bile, at the same time that the secretion of fresh bile is in some degree suspended by the causes which have been enumerated. Emetics, in such cases, are indicated independent of the general febrifuge operation, which is no less in demand in this state of the system. Wilson says, do nothing to irritate the stomach or bowels; still he recommends emetics. But although they must be irritating to the stomach and inflamed bowels, yet the irritation is of temporary operation, and they remove that irritation which is more permanent and much more dangerous.

Pringle, Cleghorn, D. Monro, Cullen, Zimmerman, Blane, Lind, and most practical writers, all unite in recommending emetics in dysentery. This concurrent testimony too, in favour of emetics, is an additional evidence of the connexion which exists between dysentery and the derangement of the digestive organs. The emetics best calculated for this purpose are antimony and ipecacuanha combined; not the celebrated vitrum antimonii cerusum, recommended by Pringle, for this is, in my opinion, an unsafe prescription for general use. Tartar emetic affords us every advantage that antimony can give us; but I prefer the combination of ipecac. (grs. xv.) and tartarized antimony grs. ij. Sir George Baker gives tartar emetic alone; Dr. Adair, emet. tart., with calomel; Dr. Saunders, emet. tart. with opium. Ipecacuanha alone is greatly celebrated, first in doses sufficient to excite full vomiting; (but in my opinion, it is not of itself sufficient to dislodge the contents of the biliary organs, which in the sluggish state in which they are usually found in this disease,

becomes indispensably necessary;) and afterwards continued in small nauseating doses, for the purpose of relaxing the surface of the body. Pringle is the great advocate of this medicine. This remedy, I believe, was first introduced in dysentery, by Piso.

Another mode of exhibiting ipecacuanha, has lately been recommended by Dr. Clarke; (see Observations on the Diseases of the East and West Indies, by Thomas Clarke,) that of administering it in the form of glyster, \mathfrak{z} ij. of the root, bruised and boiled in \mathfrak{H} ij. of water, to \mathfrak{H} j.; this to be injected two or three times a-day. I prefer the use of it by the stomach, and it frequently happens that it also operates upon the bowels as a cathartic as well as an emetic, without having recourse to injection.

The next object is to cleanse the intestines of their acrid contents. This is to be done by those means that operate most effectually, but which at the same time produce the least excitement, either to the bowels or to the whole system. With this view the saline cathartics are preferred by most practitioners; they operate without creating irritation in the bowels, and relax the system in general, promoting the secretions by the skin and the kidneys, as well as the intestines. Sulphate of soda, is preferred by many for this purpose. Huett's prescription of salts, in combination with manna, is as follows: salts, \mathfrak{z} i., manna, \mathfrak{z} ij., water, \mathfrak{H} ij., half a pint every half hour, until two or three stools are procured.

The practice in the southern states, is doubtless a very good one; that of giving salts in combination with tartarized antimony: i. e. where an emetic has not been previously administered, \mathfrak{R} . Glauber salts, \mathfrak{z} i.; tart. emet. grs. ij. aq. pluv. \mathfrak{z} viiij.; to be given in divided doses; but where an emetic has been given, salts alone, in gruel, are to be preferred; indeed, I prefer the more simple practice of administering first an emetic, afterwards a cathartic.

Zimmerman prefers cream of tartar in combination with tamarinds, as a cathartic in this disease; but this salt is not sufficiently active for the purpose for which a cathartic is now wanted. When the bowels are freely emptied, it will be an excellent febrifuge drink, as an auxiliary to more effectual means; but of itself it is not sufficient. Castor oil is also a very excellent and justly favourite cathartic in this disease. It is expeditious—it is gentle in its operation, yet effectual in unloading the intestines, in doses of a table-spoonful and repeated.

Let me here caution you against the use of rhubarb. Sydenham gives rhubarb with senna or tamarinds; Fordyce, the same; it is valuable in the last stage as a cathartic and tonic. Jalap, aloes, and the other stimulant cathartics, from the excitement and pain which they create, aggravate the inflammation attendant on dysentery, and are therefore justly condemned by most practical writers. Senna is no less exceptionable for the same reason, though combined even with manna, as recommended by Wilson.

The stimulant additions, frequently combined with cathartics, viz. cinnamon and peppermint waters, and aromatic confection, as recommended by Thomson, are no less to be avoided in the excitement of dysentery. (See his aq. cinn. \mathfrak{z} ss. combined with salts—aq. menth. pip. \mathfrak{z} iiss. in another prescription, and aromatic confection in a third: p. 278, last edition.) For the same reason avoid tinctures in dysentery; such spirituous compounds aggravate the excitement present in the first stage of this disease.

Let me here call your attention to two sources of deception in the use of purgatives. The one is, not to trust the accounts given by nurses of the evacuations which may have been obtained; the patient may have had twenty stools, and yet not one. Remember, if you have not procured a complete evacuation of the intestines, you may be very much surprised to find a great flood of matter evacuated just before the death of your patient, (when all spasmodic constriction of the bowels is taken off,) that ought to have been carried off in the first stage of the disease. This frequently happens where dysentery is fatal, and probably neglect in this respect is the great reason of its fatality. Therefore inspect for yourselves; trust only your own eyes in a disease of so much importance; it is not usually necessary in the practice of medicine to inspect the chamber-pot, but in some instances it is indispensably necessary, as in dysentery, jaundice, constipation. Inquire if the scybala we have mentioned are discharged; or at least if natural fæces, denoting the presence of bile, are evacuated. Do not rest satisfied with merely scanty, watery, or mucous discharges. Another important direction is, not to purge your patient to excess—guided by the offensive smell of his evacuations, which, as I have said before, in typhoid fevers, is frequently increased instead of being diminished by purging, inasmuch as the digestive process is impaired, and fermentation of course has an uncontrolled and exclusive operation upon the contents of the intes-

tines. Avoid, therefore, this source of deception, as well as the former. Another cathartic medicine frequently used in this disease, is necessary, especially in the form of the sub-muriate of quicksilver or calomel. It is doubtless a valuable medicine in this disease: it not only operates very powerfully upon the biliary and other secretions, which take place in the intestinal canal, but in addition to its cathartic effects, its operation upon the secretions of the system in general, render it a valuable medicine in dysentery, especially when administered as a sudorific, in combination with small doses of antimony, or James' powder or with ipecacuanha; but as a cathartic, I prefer the saline cathartics, or castor oil, and afterwards the use of calomel, with small doses of some other sudorific, especially where it is desirable to continue the evacuation by the intestines; otherwise the ipecacuanha alone, in small doses, is preferable, as prescribed by Sir John Pringle. When in the use of ipecacuanha, your patient may make free use of the vegetable acids in his drinks, but not when in the use of antimony or calomel.

But in some cases, even this last medicine, administered alone, may prove too active to the bowels. It may, then, be more advantageously directed in the form of the Dover's powder, where such cathartic effect is prevented, and its operation upon the surface secured. Another means of relieving the surface of the body, and of promoting this now desirable determination to the skin, is by the *sp. mind.*, especially in combination with laudanum, *gtt. xxx. or xl. to ʒiij.*, a table-spoonful every two hours; or the effervescing draught of Riverius may be administered. These combinations not only promote perspiration and counteract fever, but they allay, in an especial manner, the irritation of the bowels; i. e. plentiful evacuations having been previously obtained. Without a moist skin and a soft pulse, Professor Richter observes, this disease cannot be radically subdued. His remedies are an emetic, laudanum and antimonial wine; and in the advanced stage of the disease, rhubarb; but this last he considers dangerous in the commencement of dysentery. But the irritation of the intestines being still continued, (notwithstanding the remedies already directed,) and this being evinced by an increase of pain upon slight pressure, a large blister should be immediately applied over the abdomen. Blisters have a double advantage in this disease; they not only remove local inflammation, but they diminish the gene-

ral fever which attends this disease, and should be resorted to as early as possible after evacuations have been procured. In a less degree of soreness, a warm bath may be advantageously made use of, as advised by Sir George Baker, or fomentations of vinegar and water, or an application of hops, infused in hot vinegar and water, and enclosed in a flannel bag may be laid, of proper temperature, to the belly; or in case a blister is laid upon the belly, the fomentations may still be made use of with benefit, and may be applied to the extremities. These last should be frequently renewed, and applied at a moderate temperature. But neither the warm bath nor fomentations should be made use of until the first passages have been thoroughly evacuated; for they otherwise aggravate the general fever, and render it more malignant by the resorption of the offensive contents of the belly. But instead of a warm bath, or warm applications, Dr. Thomas has advised a cold bath, and cold water to be applied to the belly in this disease! He certainly has never used it, or if he has, I venture to say he has destroyed his patient; for cold bathing, or cold applications are assuredly injurious in diseases attended with local inflammation.

In your fomentations to the abdomen, or to the extremities, let me also caution you against the use of spirits, pepper, and other heating applications, as recommended by Wilson! The oil of cloves, the stimulant liniment and spirituous embrocations prescribed by Thomas, are no less to be dreaded in the dysentery, as they serve to dry the skin instead of unlocking it, and thereby aggravate both the fever and inflammation attendant upon this disease. There is an application, however, I observe, much recommended by Dr. Irvine, in this disease, which perhaps, by the great irritation it produces upon the surface, analogous to that of blistering, may be useful; I mean the spirits of turpentine, applied to the belly, and frequently renewed. That author, in his account of the diseases of Sicily, states that he has employed it in many cases with benefit. He, however, I perceive, also attaches great value to blisters in the same disease, and they are probably the preferable application on account of the greater inflammation they produce.

The excitement of the system, constituting the first stage of the disease, being subdued; the local inflammation being also controlled or counteracted by the remedies which have been

directed, the bowels opened, and the skin relaxed and perspiring, the patient still, perhaps, labours under occasional returns of irritation about the rectum and anus, but unaccompanied by the febrile excitement noticed during the first two or three days of the disease. How is this irritation to be arrested or removed? and is it safe, while the patient continues to discharge blood and mucus, instead of natural evacuations, to arrest them by any means? and what are the most effectual means for this purpose? Injections may now be had recourse to with advantage: not stimulant, cathartic enemata, but those which are calculated to soothe and remove irritation. For this purpose, oily and mucilaginous injections, combined with opium or laudanum, are to be preferred. There is a great variety of these in use. Mutton soup, prepared by boiling the sheep's head; and, by the by, many contend, that to be productive of all the advantages intended, it should be boiled, wool and all on. Strange as it may appear, there is some reason for this; for the wool of that animal, near the skin, is covered with a mucilaginous, oily matter, called by shepherds the yolk, in which the anti-dysenteric virtues probably, in part, reside. Milk and flaxseed tea is another fashionable domestic remedy. An opiate poultice to the fundament. An opium pill in the rectum. Barley, rice, sago, arrowroot, and starch, are all accordingly employed; and are all, or either of them, useful. Flaxseed and starch, however, are in most general use, $\mathfrak{z}\text{ij}$. to $\mathfrak{z}\text{iv}$. of thin starch, with $\mathfrak{z}\text{i}$. or $\mathfrak{z}\text{iss}$. of laudanum. Dr. Rutherford's preparation of flour, two or three handfuls, boiled six or eight hours, till hard; grated, made into food, with milk and water, &c. (See Parr. Dic.) Great care is necessary in administering it, lest it add to the irritation instead of diminishing it. There is no occasion where more depends on the manner in which an enema should be administered than in dysentery; for if thrown up with violence, the inflamed bowel will instantly reject it. It should be gently administered, and the pipe as gently withdrawn, that we may awaken as little sensation in the part as possible. This anodyne injection should be repeated every four hours. It will be proper, however, if the least preternatural heat and fever exists, once in every twenty-four, or, at most, thirty-six hours, to procure an evacuation from the bowels, either by a large, oily enema, composed of gruel and castor oil, or the ordinary domestic injection,

or by a repetition of half an ounce of Glauber salts, by the stomach, or magnesia calcined. The late Dr. Bayley's favourite prescription, at this stage of the disease, was four grains of rhubarb, two grains of ipecac., made into a bolus with the Theriac Andromachi. Should the typhoid symptoms still be considerable, or the contents of the bowels unusually foetid, and you have reason to apprehend a tendency to sphacelus, an injection of yeast is to be preferred to any other form of enema. I must observe that opium is not to be directed in any form, by the mouth or injection, until the inflammation attendant on this disease, and the general excitement of the system have been subdued, or considerably diminished; until you are satisfied that the pain present arises more from morbid sensibility than from inflammation, and is out of all proportion to the arterial excitement of the system. In this caution, Lieutaud, Blane, Pringle, Cullen, all concur. In the language of Zimmerman, "it is always dangerous to give opium before the fuel which feeds the disease be burnt out." The language of Huxham and Cullen is no less pointed on this subject. The same objections apply to the early use of astringents and tonics. There is, perhaps, no practice so fraught with danger as the premature use of these remedies. But again, when the first stage of the disease is completely passed over, they are not only admissible but indicated. Lime-water and milk,* chamomile tea,† the Peruvian bark,‡ oak bark, (*Quercus robur*,) logwood, (*hæmatoxylon campechianum*,) tormentil, (*torm. erecta*,) marsh rosemary, (*statice limonium*,) simarouba, as recommended by different physicians, may be in such debilitated state of the system had recourse to; but remember, when too early prescribed, you may expect every dangerous symptom that has been enumerated, and these, again, will be soon succeeded by the death of your patient. They should, therefore, be carefully avoided, while either the febrile or inflammatory symptoms continue; and those remedies should be repeated which are calculated to remove every

* Dr. Donald Monro.

† Pringle prefers this to lime water. Zimmerman also alleges, that next to opium, chamomile tea allays the pains of dysentery.

‡ Dr. Whytt preferred the bark, especially where aphthæ appeared in the mouth, or threatened the alimentary canal. Lime-water and milk is an excellent drink in this case. Magnesia, as a laxative, and borate of soda, to the part affected. Soda-water, as a drink, is also useful in aphthous affections.

source of irritation from the bowels or the blood vessels; i. e. by a continuance of the evacuations from the bowels, and of those means calculated to relax the surface, as in the treatment of typhus fever, and with the same cautions, observing the different grades of excitement.

THE DIET.

In the diet of your patient, labouring under dysentery, the same attention should be given to the different stages of the disease as in the prescription of medicines. In the first stage the patient should take plentifully of some thin diluents; and these should be taken warm. Toast-water; weak teas, either catnip or common tea; water-gruel; barley-water; or even plain water. Senac, as Pringle tells us, found warm water the best of all drinks. Senac himself, and fourteen of his patients, were the subjects of this practice alone, and continued it five or six days, with the best effects; but he at last preferred the following treatment: jgr. of tart. emet. in a pint of whey or chicken-water, every day throughout the disease; making it both the food and physic of the patient, until he recovered: it acted both as a cathartic and sudorific. Baglivi, Huxham, Tissot, Zimmerman and Pringle, all concur in the necessity and usefulness of plentiful dilution in dysentery, not only for the purpose of washing out the intestines, but indeed the whole system, by the relaxation it produces upon all the emunctories of the body. Vegetable nourishments and fruits, especially in the beginning, may be given. (Cullen.) Grapes, are preferred by Zimmerman. Any fresh fruits are proper. They are not only useful in the cure, but in the prevention of the disease; not only as antiseptics, but from their effect in quickening the biliary secretion. Mucilaginous nourishments are also peculiarly proper in this disease, not only as nourishments, but as calculated to sheath the intestinal canal from its acrid contents. For this purpose sago, *cycas revoluta* and *circinalis*, arrowroot, *maranta arundinacea*, salep, orchis mascula, rice, *oryza sativa*, barley, *hordeum distichon*, pearl barley, rendered pleasant by raisins; tapioca, *jatropha manihot* and *janipha*, cassava or cassada boiled with it; flax-seed tea, *linum usitatissimum*, are among those to be preferred. All writers on this subject, agree on the bad effects

of animal food. They add to the septic state of the bowels, and of the whole system. Baker, Pringle, Zimmerman, D. Monro, are all opposed to it in every shape, even in the form of soups. "Not even chicken soup," says Sir George Baker, "should be allowed in this disease," "nor mutton broth," says Pringle. Akenside, however, to our great surprise, we find recommending animal food, even in a solid form; beef-steaks in a dysentery, animal food in typhus fever! I should rather consult him as a writer on the pleasures of the imagination than follow his directions in dysentery. Another fashionable prescription, much in use, is mutton suet, boiled in milk, with cinnamon and loaf-sugar. This is not admissible in the first stage, but the good women of our city, finding it good in the last stage of dysentery, conclude that they cannot begin too soon, nor have too much of a good thing. In the second stage, let me observe that vegetable nourishments should still be continued; but that they may now be advantageously given with wine; or if the stomach be inclined to acidity, with a moderate quantity of brandy. But recollect, that by giving these articles too early in the disease, you introduce so much fire into the already inflamed intestines.

Attention to regimen in this disease is no less important than is our prescription of medicines, or directing the diet of your patients. Inasmuch as dysentery is propagated by means of the excrementitious discharges, there is no rule more important than that these should be instantly removed from the chamber of the sick. Another direction in this case should be that the alvine discharges particularly, should not be thrown in the common privy, but buried; for privies, it has been observed by all writers, become the principal means of spreading the disease throughout the family or the camp wherever it may occur. With the same view, the clothing of the patient should be frequently changed; both that which constitutes his bedding as well as his bodily clothing; and let me add, that flannel worn next the skin constitutes the most proper dress of the patient in this disease, as well as the greatest security in guarding those who are well against an attack of it. Dewar, in his observations on dysentery, particularly recommends a swathe of flannel to preserve warmth about the abdomen, and to give support to the weakened bowels. There is perhaps, no one direction in the treatment of dysentery to which he attaches more value than to this application, alleging

that he has ever found it attended with the best effects. But *not* only the clothing, the bed and the bedding should be frequently changed and aired, in this disease; and the air itself of the apartment should also be frequently renewed, and all noxious materials removed as far as ventilation and the disinfecting processes can effect such changes. I need not repeat the processes employed for this purpose, which have been so fully detailed to you. Having removed the inflammation and other sources of irritation from the bowels, and having obviated the general fever, you have now a second indication—to build up the strength of your patient by means of tonic medicines and such system of diet as will be best calculated to counteract the debility that has been induced. The bitter infusion with the addition of the carbonate of potash or soda, and a small quantity of rhubarb will be peculiarly calculated for this purpose—they are among your best tonics. Madeira and Port wines are also now to be allowed the patient, and that freely in proportion to his weakness. Dr. Brocklesby allowed his patients \mathbb{H} iss. to be taken daily if necessary. Dr. D. Monro directs brandy and water to be taken, if the use of wine should be followed with acidity or pains in the bowels—an excellent direction. The patient, too, should return gradually to the use of animal food. As there still remains more or less of the typhoid state of the system, he should still continue the use of the vegetable nourishment in part, and when soups are first made use of, let a large proportion of vegetables enter into their composition, as rice, celery, &c.; but if the stomach be especially debilitated and there exists a great tendency to fermentation of its contents, animal food in the solid form is to be preferred, followed with a glass of brandy and water—steadily continuing the use of the bitter infusion, or perhaps as recommended by Dr. Whythe, an infusion of bark may be now advantageously administered in conjunction with the Japonic confection \mathfrak{z} ijj., or the R. of kino, \mathfrak{z} ss., to \mathbb{H} i, of the infusion. The infusion of bark with lime water is also in some cases preferable. But perhaps your patient has lost a great deal of blood by hemorrhage—his bowels remain in too relaxed a state, or upon falling asleep, such is his debility that he sweats profusely—astringents in such cases are indicated. With this view an infusion or decoction of the bark with the addition of the elixir of vitriol, may be given the patient. Some direct the nitric acid, as in the following prescription, or a combination of the

nitric and muriatic, viz: gtt. ii. of the nitric, gtt. i. of the muriatic, with laudanum, proportioned to the irritation. See Good, vol. ii. p. 470. Nit. acid ℥ij., opii. gr. ij., aq. font. ℥iij. M.; a tea-spoonful every three or four hours, in any vehicle, say Port wine. By the by, in such cases, port wine too, or even spiced with cinnamon, is to be preferred, for the purpose of restraining the excessive discharges to which the patient is yet exposed. And indeed it may still be necessary to have recourse to an opiate mucilaginous enema to allay the local irritation which may remain in the lower bowels—for tenesmus not unfrequently remains after the disease has been subdued and the patient is convalescent. I have occasionally been obliged to have recourse to some means of this kind to quiet the irritations which thus remain. In some instances I have done this by a small quantity of paregoric elixir—by a pill of opium and ipecac, say one-quarter of a grain of opium, and gr. i. of ipecac., or a pill of opium introduced into the intestine as a suppository. But in other cases, instead of excessive discharges there is a tendency to a confined state of the bowels. You should be no less attentive to obviate this state of things either by a mild cathartic injection, or some mild aperient taken by the stomach, with this view. Small doses of rhubarb and magnesia, with mint water, may now be administered in divided doses, for the bowels neglected, a putrid colluvies will soon be formed in the lower intestines, and a renewal of the inflammation may soon be expected as the consequence. As soon as the patient is enabled to take exercise, and the weather will allow him to leave his chamber, his recovery will be very much hastened by the stimulant effects of the open air. Where ulcerations have taken place in dysentery, the turpentine and the balsams have been recommended on account of their stimulant effects. It is plain they can only be admissible in the last stages of dysentery, and that they can only be useful where you have the evidence of such ulceration having taken place, and that more or less purulent discharges are still continued denoting this ulcerated condition.

LECTURE XXX.

FEVERS.—PLAGUE, OR PESTIS ORIENTALIS.

UNDER the present system of quarantine laws, which the legislature of this state in particular, in their wisdom have adopted, while they continue to be faithfully executed, we shall probably never have occasion to prescribe for the plague. Still it is possible, from the commercial character of our country, that we may be visited with this form of pestilence, as we have been by the yellow fever and other contagious diseases. The late prevalence of this disease, on the coast of Barbary, with which we hold communication, ought to prepare us to expect a visitation of this nature; and our government, in its quarantine regulations, should ever keep this event in view—for a chest of clothes of a person dead of the plague, introduced into any part of our cities, would infallibly spread the disease as it has done in different parts of Europe; and the utmost vigilance, with respect to that source of it ought, in the increasing intercourse we are cultivating with that quarter of the world, to be exerted by all concerned in the responsible station of guarding against the introduction of foreign diseases. It is important, then, that the physician should become acquainted with this disease, not only because it is a reproach to be ignorant of it, but because it is possible that he may want his knowledge of it at the bedside, should accident so introduce it. It will at least be useful for us to know the peculiar characters of the plague, as it is calculated to reflect light upon those general principles that we have endeavoured to impress upon your minds with regard to the nature and treatment of contagious diseases in general.

Dr. Cullen defines the plague to be "*typhus maxime contagiosa cum summa debilitate—incerto morbi die eruptio bubonum*

vel anthracum." But Dr. Cullen, on account of these buboes and carbuncles, and perhaps the petechiæ attendant on this disease, has very improperly placed pestis in his order of eruptive diseases. He might, with equal propriety, have placed typhus among his cutaneous diseases. As the plague is attended with general fever, and is naturally allied, in many of its features, to many other forms of fever we have noticed, I have placed it in the class of fevers properly so called. The first source of this disease, like smallpox, syphilis and others, is not yet developed. It is well known, however, that it has long infected the western parts of Asia, from the thirtieth to the forty-second degree of north latitude. The Carthaginians were afflicted with it at least two thousand three hundred years ago. Thucydides has described the plague which wasted the city of Athens two thousand two hundred and eighty years since. Procopius mentions a plague which appeared in the five hundred and fortieth year of the Christian era, and which is stated to have threatened the very destruction of the human race. At that time it was not confined to one spot, nor to one season of the year. It is said to have spread in the winter as well as in the summer, and to have spared no situation, "neither island, cave, or mountain," says the historian.—(Williamson in Med. and Phil. Reg. vol. i. p. 28.) It is, however, remarkable that it did not prevail in Egypt, which many call its birth-place, during the greatest population and splendour of that part of the world, and when it was governed by its native princes; and when, too, it contained larger cities even than Cairo; it was then proverbially a healthy country. Herodotus gives pointed testimony on this subject. He says, "After the Africans, no people are to be compared with the Egyptians, in health and vigorous constitution." And to this advantage he adds, "the climate, which is subject to no variation, may effectually contribute." But when the Egyptians came under a foreign yoke, their character changed, their enterprise destroyed, their canals neglected and obstructed, the consequences were, collections of stagnant water, and the air loaded with mephitic vapours; their country, as was to be expected, whether we consider this state of the air to operate as a predisposing or an exciting cause, became the seat of pestilence.

In 1346, a plague began in the northern parts of China, spread through Asia, crossed into Europe, by way of Constantinople;

from thence it traversed Greece, Italy, Germany, France and England. Indeed, since Marseilles, which is in the forty-third degree of north latitude, began to trade to the coast of Asia, it has been visited at least ten or fifteen times with the plague. England also, since she has engaged in the trade of the Levant, has suffered frequently from that deadly disease. Even the Russians, when at war with the Turks, introduced it into their northern climate by means of goods that had been brought from the infected cities of their enemies. It accordingly spread in Moscow in 1771, although that city is in the fifty-fifth degree of north latitude! It has, therefore, as you perceive, not been confined to the eastern hemisphere; and indeed, in some countries of the east, as Persia and Japan, it was altogether unknown; and I believe they still remain exempt from the visitations of this disease. For a more full history of this disease than my time will allow me to give you, I must refer you to authors—Mead, Sydenham, the two Russells, viz. John, the author of the History of Aleppo, and Patrick Russell's History of the Plague; Merten's Plague of Russia, and Samoilowitz, a Russian physician; Dr. Guthrie, on the same subject; Assalini, on the Plague of Egypt; Volney, Desgenettes's Memoirs; Sir Robert Wilson, Savery, McGregor's Sketches of the Expedition from India to Egypt; Sonnini's Travels into Greece and Turkey, and Dr. Williamson's Observations, contained in the Med. Register, will furnish you with ample materials on this head. Dr. Cullen has called the fever attendant on plague, the typhus form of fever. True, it has many symptoms which would entitle it to that appellation, but it has other symptoms which give it a totally distinct character, and which, in my opinion, constitute it a distinct genus. Besides its general febrile symptoms, it is characterised by the presence of buboes and carbuncles, which are its general attendants, as you will find upon consulting the works before referred to, especially the valuable and elaborate work of Dr. Patrick Russel. "Of 2700," says Dr. Russel, "afflicted with plague, 1841 were affected with inguinal buboes; of the same number, 569 axillary; 231 parotid; 74 spurious; and 490 carbuncles." I ask you, is this typhus fever? Is this bilious remittent? And I ask, will you call him a physician that can confound plague with those diseases; or who can pronounce plague to be the yellow fever? For in yellow fever, none of these characteristic symptoms of plague are

to be found among its usual attendant symptoms. For these reasons I have made the plague a distinct disease from every other form of fever; though it must be acknowledged it bears a much greater resemblance to the yellow fever of the tropics than to any other species or genus of fever.

The invasion of this disease is like some other contagious diseases, frequently sudden and violent. And in some cases, the person attacked drops as instantaneously dead as if he had been shot with a musket ball. In many writers on this disease, when it has been epidemic, it is stated that persons have been found dead in the streets—so of yellow fever. In other cases, so violent is its operation on the system, that they perish within twenty-four hours from the time of the attack; but most generally the disease is of several days continuance. In some cases it has continued to the thirteenth, and even to the seventeenth day. Its duration, however, is uncertain, depending upon the character and progress of the local symptoms, which we have observed to characterise it; viz. the buboes and carbuncles. Buboes, in some cases, appear very early, and suppurate early. In such cases, the disease is rendered comparatively mild and of short duration. Where they are late in their appearance, the disease exhibits a more formidable character, and is at the same time more tedious. Carbuncles, again, are, for the most part, the attendants upon the advanced stage of plague, and arise from the vitiated state of the system belonging to that period of the disease, in addition to the exhaustion of the vital powers induced by the poison engendered by the disease. On both these accounts, then, carbuncles in plague are considered as more alarming and dangerous symptoms than buboes. Petechiæ, too, arising from the same source, appear in this, as in other typhoid forms of fevers. Some physicians, seeing these facts, have been induced to make a division of the disease into species, according as buboes, carbuncles or petechiæ, are predominant symptoms; but such distinction is at least useless, if not absurd; for it is with the plague (see Thomas, p. 234,) as with other febrile diseases. Its character is very much changed by the circumstances of season and situation, as well as the habit of body in which it occurs. Accordingly, in Dr. Russell's practice, you will find many varieties noticed as arising from the operation of these causes; and in Sir J. McGregor's *Sketches of the Expedition from India to Egypt*, you will also

see the character of the disease very much changed by the state of the air, whether it occurs in the crowded hospital or in marshy grounds, or in the cold, rainy months of December and January, assuming the more malignant, remittent and inflammatory character. The vital functions, in plague as in yellow fever and other diseases arising from contagion, show the deleterious operation of the poison producing the disease. The pulse is sometimes, from the commencement, very small and feeble; in other instances, it is remarkably slow; while again, in other cases, the pulse, as in yellow fever, is very little changed in any stage of the disease; i. e. the poison of the disease fastens on other parts of the system, and therefore affects the heart and arteries less. Respiration partakes of the same influence. It is frequently attended with great anxiety, despair and depression; and these symptoms, as in yellow fever, are generally considered as fatal symptoms; especially if they appear in the commencement of the disease. The tongue, as in other contagious diseases, is frequently moist and natural throughout the whole progress of the disease; but in other cases it is slightly furred. The thirst, in some cases, is great, but in others it is not remarkable. The skin is usually described as dry and parched, in some cases moist; but when moist, it affords a favourable prognosis. The perspiration has been remarked to be oftentimes fœtid to a very great degree in this disease—probably owing to climate as well as the character of the disease itself. The same is observed of the breath of the patient, that it very soon manifests an uncommon fœtor, attended with great nausea, and sometimes a vomiting of dark bilious matter. In some cases an irrestrainable diarrhœa takes place, and soon hurries off the patient. Hemorrhages are also of frequent occurrence in the plague; and, as in other fevers of a typhoid type, they are generally considered at least as dangerous, if not fatal symptoms. They take place from the nose, gums, stomach, liver and bowels, as in yellow fever. But the black vomit, I mean the coffee-ground black vomit, one of the characteristic symptoms of the yellow fever, is scarcely known to occur in the plague.

Buboes usually appear on the first, second, and third days—oftentimes on the first day—and when proceeding early to suppuration, they are among the favourable symptoms. They probably direct the excitement of the whole system to a particular part, less dangerous than when the same irritation is expended upon

the other parts of the frame, and especially upon the vital functions. Buboës, under any circumstances, are considered by Dr. Guthrie and others, as less alarming and less fatal than carbuncles, and for the reasons we have already assigned. Indeed, carbuncles and petechiæ are both unfavourable symptoms in the plague; for carbuncles, when they prove fatal, become gangrenous, assuming the usual malignant aspect of the anthrax, properly so called. And it is also observed in plague, that petechiæ and maculæ, or ecchymoma, frequently turn to carbuncles—so says Samoilowitz in his *Account of the Plague of Russia in 1771*. Seeing this malignant train of symptoms to attend upon the plague, you will be prepared to believe that it is one of the most fatal diseases of mankind. Of the French army that invaded Egypt, according to the Report of Desgenettes, the chief physician to that army, but little more than one-third of all that took the disease recovered.

This leads me to a remark or two relative to the causes of plague. This disease, until very lately, was universally admitted to arise from, and to be propagated by, a peculiar contagion. It is also generally remarked to show itself about four days after exposure to persons labouring under it, or after a similar exposure to infected goods. The infection, too, is generally limited to a few feet, and is communicated chiefly by contact, or very near approach to the source of the infection. In this it is unlike other contagious diseases. Warm weather is considered to be favourable to its progress. Cold, on the contrary, is unfavourable to its increase. Sometimes, however, like typhus fever, it continues throughout the winter. Sometimes, too, it is checked by great heat. In all the plagues of Aleppo, of the last century, it has always ceased in the months of August and September; i. e. during the greatest degrees of heat. Sonnini (*Travels*, p. 255,) observes “that the contagion of the plague never failed to cease at once at the summer solstice.” It is only during a season of moderate heat that it has ever been observed to prevail extensively. In Europe it has invariably raged most violently and fatally in the summer and autumnal months, especially in September and October. In the plague of London, of 1665, the deaths from the plague were most numerous in August, 20,046; September, 26,230; and in October, 14,373; but ceased altogether with the winter’s cold; for the cold weather of northern climates

has invariably been observed to check the ravages both of the yellow fever and the plague. On the contrary, however, as I have just remarked, the extreme heat of southern latitudes is equally adverse to the propagation of the contagion, so that the disease is, in fact, unknown in tropical climates. In Egypt and Syria its progress is always suspended during the hottest months of the year. This too, is a strong diagnostic between it and yellow fever. As in yellow fever, infants are less liable to it than adults; but even those at the breast are not exempt. The poison of plague, also, like that of the fever, is communicated to the foetus in utero, for children are born with the sores of plague on their bodies; and added to this, the plague is generally fatal to pregnant women.

That the plague is not known to arise spontaneously any where, but is always to be traced to contagion; and that the distance to which its infection extends through the atmosphere is very small, are established by general agreement.

Some particular persons, in a most remarkable manner, escape this disease, as is peculiarly the case with attendants on the sick, the effects of habit, yet we know, in many instances they have no immunity or exemption from its attack. According to Sir. J. McGregor, of thirteen physicians, seven took the disease, and four of the seven died of it; and in the plague of Marseilles, which we have noticed as recorded by Bertrand, confessors, physicians, nurses, all took the infection. (See my paper on Contagion.) This disease, too, as we have already seen, in the cases of Matthias Deggio, as related by Dr. Guthrie, Dr. White, noticed by Sir Robert Wilson, the Russian surgeon by Sonnini, and by Mon. Eusebius Valli, is communicable from one to another by means of inoculation, which abundantly demonstrates the fact that the plague, although it is governed by the laws belonging to my third class of contagious diseases, is still a disease *sui generis*. But in addition to this cause, viz. contagion, as a mean of propagating the disease, it is also stated, that other agents operate in the production and propagation of it in its native country; viz. putrid animal and vegetable substances; noxious exhalations from the slimy deposits of the Nile, crowded and confined dwellings, want of cleanliness, bad diet, either from damaged grain and other provisions, or the excessive use of animal food. A moist state of the atmosphere, according to Sir Robert Wilson,

is also considered among the causes favourable to the production of this disease. He adduces two facts in confirmation of this observation; the first is, that the English and Turkish armies that marched to Cairo escaped the contagion, though they passed through many villages that were infected with it; while the troops that remained stationary on the shores of Aboukir, exposed to a moist air, were severely affected, and lost many men. The second fact is, that a dry air operated to prevent the disease; and indeed, in one instance, it appeared to act as a remedy, after the disease had commenced. He accordingly states, that several men who were ill of the plague in the hospital at Jaffa, escaped into the desert, and endeavoured to reach the army; but not succeeding, they returned in three days, perfectly recovered! Those too, who were exposed to vicissitudes of heat and cold, were remarked to be more liable to, and to suffer most from, the plague. Accordingly, bakers, smiths, and cooks, were noticed during the late campaign to Egypt, to suffer most from this disease.

Mr. White, although he contends that the plague is never introduced by contagion, has the following remark. "None contend that the plague is not like all fevers, more or less infectious, according to habit of body and duration in bad air; but that the disease hangs only in the atmosphere, or breath of the immediately affected patient, not to be conveyed by touch on a third person." (Expedition to Egypt, p. 253.) He also acknowledges his embarrassment in accounting for the "partial infection of atmosphere, which at present can only be attributed to the different degrees of fœtid matter left on the ground, producing the quantity of putrid miasmata." But this difficulty vanishes if we admit the classification we have proposed, and the laws of communication to differ with different classes. No wonder Mr. White remarks, that the problem is arduous, that if the plague be contagious, and not like the small-pox, to be had only once in a life, how, in a country where no care is taken to check the extension, population has not long since become extinct. p. 255.

But for the reason that the plague is not small-pox, we should expect it to be governed differently.

TREATMENT OF THE PLAGUE.

In the treatment of the plague, we shall find that there is no less resemblance to the yellow fever, than we have observed in

many of its symptoms. In some cases, according to Dr. Russel, the lancet was found to be very useful ; while, in others, it was a dangerous and fatal practice. In the hands of Dr. White, it proved fatal to all upon whom he employed it ; but Dr. Russel remarks, that when employed early in the disease, a plentiful bleeding is of very great service. Most writers, however, advise this remedy to be cautiously and sparingly employed ; and when employed, that it should be in the invasion of the disease. It is a good rule in this, as in the yellow fever, "to avoid extremes." Emetics are also, as in many other fevers of the typhoid character, considered as very useful ; for the stomach is not in plague, as it is in the fever, the seat and throne of the disease ; on the contrary, the patient in the plague not only bears the operation of vomiting, but it is absolutely necessary, for in this disease it frequently happens, that there is a very diseased condition of the stomach, biliary organs, and intestinal canal ; this is evident from the nausea and vomiting, and bilious discharges, which appear upon the invasion of the disease. Dissections, too, have discovered the gall bladder to be loaded with a dark coloured bile, and attended with an obstruction and enlargement of the liver itself. Cathartics are also indicated, but most writers concur in recommending the mildest to be made use of in this disease ; alleging that diarrhœa is always dangerous :—laxatives, injections, and suppositories, are accordingly preferred to active purges ; and when diarrhœa supervenes, the most active astringents with opiates are industriously made use of to restrain it. But of all the means made use of to control the violence of the plague, and to divert its ravages from the vital organs, is sweating. This, whether it takes place spontaneously or is induced by art, is found to be beneficial in this disease. I mean, when induced by those means that do not add to, instead of diminishing the excitement of the system ; for, doubtless, we will all agree with Dr. Falconer, of Bath,* that the sweating regimen as formerly practised by hot drinks, heated rooms, feather beds, and loads of bed-clothing, has been, and must be, a fatal practice, in any fever. Yet it does not follow, as Dr. Falconer has inferred, that because the patient, noticed by Savery, who tied himself on the deck, exposed to the dews and cool night air, recovered from a severe attack of the

* Essay on the Plague.

disease; or because the French soldier, recorded by Desgenettes, threw himself into the Nile, and also recovered; that therefore every patient must do the same, or that Dr. Curries' cold water treatment must, in all cases, be pursued: on the contrary, I believe such practice to be dangerous in the extreme, in any febrile disease, where either the disease itself has been caused by a poison, originally introduced, or where the disease, whatever may have been the cause of it, exhibits, in its progress, the vitiated state of the whole system. In either of these cases, as I have very fully stated, the process of perspiration is peculiarly salutary: 1, by diverting the excitement from the vital organs; 2, by conveying out heat; and 3, by carrying off those morbid materials which, in health, are constantly passing off, and which, retained, must necessarily aggravate the already diseased condition of body that attends on fever, especially fevers arising from contagion; and that, therefore, this cold regimen, which restrains or checks this important discharge, must be injurious in the manner recommended. It is in confirmation, too, of the benefits that are derived from perspiration in the plague, that the practice of rubbing the body with warm oil has been so universally and so successfully employed in this disease, as stated upon the authority of Mr. Baldwin, the British Consul General in Egypt; you will also see an account of it in Dr. Duncan's *Med. Com.* for 1797. In this account you will perceive, that it is not from any virtues contained in the oil, but the perspiration induced, that proves so beneficial; and, indeed, the whole manner in which it is to be made use of is calculated to effect such perspiration. The patient must be in a warm room; he must be briskly rubbed, and, as stated, for the purpose of producing a profuse sweat, he must take warm sudorific drinks, such as elder flower tea; he must, too, be exposed to the fumes of juniper berries and sugar to aid it; and every precaution is employed to prevent cold from checking his perspiration; his linen must not even be changed, until his perspiration has subsided, and, indeed, the friction is directed to be repeated; all these show clearly the manner in which the oil is to operate. The same good effects from this application are noticed by Assalini, who also ascribes its salutary operation to the copious sweating it produces. During the prevalence of plague in West Barbary, in 1799 and 1800, Mr. Jackson, in his account of the Empire of Morocco, states, that it was also very successfully employed.

But it is observed that it has a salutary effect in preventing the disease, as well as curing it. The same writers allege, that the dealers in oil, as well as those who are employed in rubbing the sick, escape the disease ; that even the porters and labourers who work in the oil stores are exempt from its attack. I rather suppose, that the exercise of these men, by the steady perspiration such labour produces, in part preserves them from the influence of contagion ; for in the great plague of London, it was observed that those who were dealers in pitch, tar, and tobacco, also escaped the contagion ; probably, upon the same principle, but not that those articles furnished any peculiar antidote to the poison of the disease. In like manner, the application of oil has been found serviceable in the yellow fever of the West Indies ; but long before the introduction of the oil as a remedy, the sudorific treatment, as recommended by Dr. Warren, was found no less successful. The best means of preventing the operation of contagion, if the observation we have already made on this subject be correct, will be cleanliness, ventilation, and purifying the air, by the processes pointed out, by means of the nitric, muriatic, and acetic acid gases.

LECTURE XXXI.

YELLOW FEVER.*

ON the yellow fever I have few observations to make to you ; for I have so frequently, in the course of our remarks on fevers in general, had occasion to refer to this subject, that to dwell at this time on this topic, would be to repeat at least much of what has already been said. I shall therefore, in a very summary manner, call your attention to the leading features of this disease, the causes from whence it arises, and that mode of treatment which has been found most successful, especially in the United States. Typhus icterodes cum flavedine cutis, is the definition given of the yellow fever by Dr. Cullen. But this yellowness of the skin combined with typhus, does not alone constitute the characteristic symptoms of the disease when it proves fatal ; for besides this yellowness there is very generally, on or about the third day, not before, more or less disturbance of the stomach or biliary organs, showing itself in the vomiting of black matter. This is indeed so generally attendant on the malignant form of the fever, that the Spaniards thence call it the vomito prieto, or black vomit, from the frequent presence of this symptom, especially when the disease terminates fatally. This appellation of black vomit is therefore quite as appropriate as yellow fever ; for where the disease is early arrested in its progress, and the excretions are steadily kept open, such yellowness is frequently pre-

* I retain the term *yellow fever*, for as Dr. Willan observes of scarlet fever, "however offensive the term may be to a classical ear, it cannot well be displaced, having found admission into all the systems of nosology." Page 253, Diseases of the skin.

vented. A definition of the yellow fever ought, therefore, to embrace more particulars than Dr. Cullen has included, otherwise we should be at a loss to distinguish it from jaundice, which in some cases proves fatal, and is rendered so by the typhoid symptoms that occasionally attend on that disease, as in the cases already referred to. In like manner we should mistake other diseases of the liver for the fever, that is, judging merely from the colour of the skin. We should also in other cases, confound it with the bilious remittent—whereas, the state of the stomach and biliary organs enables us very readily, for the most part, to separate those two diseases. In the first place I remark, that the yellow fever, as far as regards its origin, is a disease peculiar to the tropics, or those climates which experience the heat of the tropics, both in degree and duration. But it is occasionally conveyed into higher latitudes, where, like the fruits and other vegetable productions from the tropics, it is preserved and even propagated in the hot seasons of the year, that is, while the heat remains at, or nearly at that temperature which gave it birth. But again, as the tropical fruits are destroyed by the cold of winter, so is the yellow fever extinguished by frost. It has accordingly appeared at various times in the south of Europe, and in various parts of the United States. But it has invariably, in those cases, been introduced from the tropics, and then usually from the West Indies, or from South America. I shall also then have an opportunity of showing you that the fevers which prevailed in the Greek islands, and the dark coloured vomiting, as described by Hippocrates, were totally different from the yellow fever with which they have been confounded by a learned physician of this city, in his report lately published on this subject. I shall also take the same occasion too, to satisfy you that the same writer has been hastily led on to similar errors, when he confounds the yellow fever with the fever hemitritæa of Baglivi, generated by the marshes of the neighbourhood of the city of Rome. The very direction given by Baglivi, that the patient is not to take a purge until the seventh day of the disease, should alone have prevented him from falling into this error. It has also been engendered on the coast of Africa, as was the case in 1793, during the memorable expedition to Sierra de Leone. On this occasion it first appeared in the ship Hankey, and such was the mortality that it created in the crew of that ship, and those

concerned in that voyage, that it totally defeated the objects of that expedition. The Hankey proceeded to the island of Grenada. The disease immediately spread with great mortality, not only in that island, but extended itself to the other islands. It was in that same year, too, introduced into Philadelphia. Dr. Chisholm has given you a record of its ravages, in his very able and instructive work on the pestilential fever as it appeared in Grenada, &c.; and which you will consult with great pleasure and instruction—pleasure as it regards the manner in which it is written, and instruction from the matter which it embraces. It affords the best evidence of the correctness of Dr. Chisholm's views, that the Board of Health of Great Britain, when they investigated the subject, ordered that ship to be burnt, which was accordingly done.

2. In the tropics, too, the yellow fever is not generally a disease of the natives, but of strangers, and particularly such as arrive from the north, who have been unaccustomed to the intense heat of the tropics. It may be called then, a disease of the northern man in the torrid zone, and to which he is especially liable upon his first arrival.

3d. This disease shows itself in various grades, depending on particular circumstances, as upon the state of the air, habit of body, previous modes of life, intemperance in drinking, excesses in eating, bad provisions, particularly the excessive use of salted provisions. In the insulated individual it will exhibit one character, but in a congregation of soldiers or sailors, it will show another. Hence, too, in the one case the disease terminates with the individual, as was the case with young Roe; but in the other the impurities of the air add to its malignancy and render it communicable from man to man in the manner that has already been particularly pointed out.

4th. When thus communicated, like the plague, four or five days usually intervene between exposure to the contagion and the appearance of the disease. For the evidence of the contagiousness of the yellow fever in this country, let me refer you to the facts and observations published by the College of Physicians of Philadelphia, particularly to the evidence furnished by the late Dr. Kuhn, Dr. Wistar—Wistar's alone is sufficient and unanswerable—Dr. Samuel Griffiths and others. They have borne testimony on this subject not to be controverted. See also the

Medical and Philosophical Register, which has been chiefly devoted to that object, and for which, in a great degree, that work was undertaken—and I trust it has not been unsuccessfully devoted to this important subject, for it contains a body of facts attested by the most respectable evidence, and which I assert, if I know what truth is, is not to be resisted. Read the letters of Dr. Thomas, August, 1816, Sir Gilbert Blane, 1816, do. 1818, in which they express their astonishment at our physicians—"their inverted intellect." The yellow fever of Gibraltar in 1804, recorded by Gilpin, in the 37th No. of the Medical and Surgical Journal of Edinburgh, for January, 1814—yellow fever of Gibraltar, in 1813, Medical and Physical Journal, No. 181—Burnett on the same subject, No. 184—Pym's observations on the Bulam fever, as introduced in the West Indies, on the coast of America, Gibraltar, Cadiz and other parts of Spain—Medical and Surgical Journal, July, 1815, will furnish you with the most conclusive proofs of the contagiousness of this disease and of its introduction from the tropics into the other places mentioned. See also reports on its introduction from the Havanna into Barcelona, in 1821—Walsh's Museum, No. VI. p. 534.

5th. That the yellow fever does not arise from putrid animal matter, the observations by Dr. Chisholm, which is in all your hands, in the appendix to Thomas, abundantly prove. That it is not the product of vegetable decomposition, the testimony of Dr. Stuart also satisfactorily demonstrates. Was it necessary to adduce additional testimony on this subject to show that this disease has not originated from the filth of your cities, I might refer you to the filthy condition of this city, in particular before the revolutionary war, and the offensive state of it during the war, when crowded with British troops, especially after the great fire of 1776, when the cellars of the numerous buildings then destroyed, were made the repositories of filth of every sort. At that time, too, we had nothing like a system of police regulations, yet we enjoyed an almost unexampled state of good health. But again, if we for a moment advert to the offensive state of our ships, our wharves and market places, our cellars, our privies, our tanneries, slaughter-houses, tallow chandleries, manufactories of glue, morocco, and starch, all of which, in the summer season, load the air with the most offensive vapours, and these, too, in

the very heart of our city, without engendering this disease, we shall be compelled to look to some other source to which this disease must be traced—indeed, common sense rejects this doctrine as altogether puerile; for were filth the parent of this disease, its annual return would be inevitable, both in the city and country. This result is unavoidable. Nay, every stable, farm-yard, or hog-pen, would engender it, if decomposed animal and vegetable matter is to be considered as the source of this form of fever. But remember a foul state of the air has its agency by spreading the disease in the manner already explained, when the poison has been introduced. But on this subject I need say no more; but shall proceed to notice the more prominent symptoms of this disease.

Yellow fever, like the plague, frequently comes on by a violent invasion of the nervous system. In many cases, the persons exposed to the contagion are sensible of the effects of the poison, by its deleterious operation upon the brain, not by its offensive smell, but a peculiar operation upon the sensibilities of the system. The late Dr. Richard Bayley was conscious of receiving the poison to which he fell a victim, and declared the same at the time he was seized with his fatal illness; yet that gentleman went to the quarantine ground an infidel on this subject: so says his successor, Dr. Joseph Bayley. Dr. Treet, another of our health officers, also died from this disease, contracted on board the *Zephyr*, the same vessel that introduced the yellow fever into this city in the year 1795. On his way home, after visiting that vessel, he stopped at the house of the Rev. Dr. McKnight, and at Mr. Isaac Clason's, both of whom he informed, and from whom I received my information, that he believed he had taken the fever, which had been prevalent on board, and which had been very fatal at Port au Prince, from whence she had arrived; he was immediately confined to his bed, and died in a few days with black vomit and all the other characteristic symptoms of this disease. His whole nervous system, at the time of his attack, was violently assailed; he felt great distress at the præcordia, some delirium, and at the house of these his friends, called for a cup of drink to counteract the distressing feelings he there experienced. Dr. Ledyard, another of our health officers, also entered upon his office an unbeliever; but he was converted to the faith by a very short residence at Staten Island. Dr. Joseph Bayley, too, who had entertained

some doubts upon this subject, and who, even at the time he received the honours of the College, expressed an equivocal belief of the contagious and specific character of the disease, in the Dissertation he published, has now the most unqualified belief of the opinions which I have expressed to you, that this, like the plague, is a disease *sui generis*.

In its attack, like the plague, in some instances, it produces instant death; in others, mania; in most it comes on with a very acute distressing pain in the head, particularly across the forehead, and oftentimes in the eyeballs themselves; in others it affects the brain by stupor; the pain, too, usually is severe in the course of the back, and extends throughout the limbs, following the spinal marrow and larger nerves. In other cases, again, its force appears to be chiefly vented upon the præcordia, creating great anxiety and depression.

This disease, in some instances, comes on with chill, and occasionally with rigors; but not so the greater number of cases; they are most generally without the chill attendant on intermittent and remittent fevers.

The pulse is usually increased in frequency in the first stage of the disease. In some cases it is but little affected, in others it is soft throughout; in others it is slow and healthy to the last moment of existence.

The tongue is moist and clean too in some cases; but in most slightly furred; and in others covered with a yellowish sordes, in others a white fur. There is no thirst, or not usually troublesome. The skin is flushed and hot, but sometimes so little affected that the patient is not usually considered to be very ill.

The respiration is quickened and frequently very anxious, with much sighing and hysteria. The belly is costive.

On the second and beginning of the third day, if not relieved by evacuations and by perspiration, with attention to the different excretions, a yellowness of the adnata of the eyes, of the neck, breast, and upper part of the arms, supervenes, and gradually extends itself over the whole body. This symptom is probably occasioned by a change produced in the blood, and is not to be attributed to the absorption of bile, as many have supposed. Indeed the biliary organs do not show any peculiar derangement in the commencement or at the early stage of the disease; whereas the stomach is especially acted upon; for it is, as expressed by

Dr. Warren, the very seat and throne of the disease; indeed, after death, it is found that in yellow fever there is rather a diminished secretion of bile, and very little found in the gall bladder. The disease too frequently occurs in the inflammatory, not the bilious, habit of body. It is otherwise in the bilious remittent; in that the biliary organs are at first affected, and show the effects of their derangement in every part of the system, in a yellow skin, yellow eyes, yellow sordes upon the tongue, a bitter taste in the mouth, yellow turbid urine, &c. Nor is the yellowness which supervenes upon the third day of yellow fever, of the golden yellow of bile, but of a different hue, partaking of the colour of the orange, mixed with the reddish hue of copper. The explanation given of it by Dr. Warren, of Barbadoes, that the serum derives its change from the decomposition of the blood, as is produced by the operation of poisons upon the system, or analagous to the changes produced in blood that is extravasated and has lost its vital principle, is, in my opinion, much more satisfactory; for a total decomposition, or death, very generally soon succeeds to this change of colour, and is attended with all the symptoms which, in fevers, announce dissolution, as hemorrhages, petechiæ, &c. About the same period that this yellowness displays itself upon the surface of the body, great irritation shows itself in the stomach; a sense of heat and burning now takes place, attended with hiccup, and occasional gulping or disposition to return the drinks that may have been swallowed. At length they are rejected as fast as they are swallowed, and with some force; and when drinks are not taken, the stomach still acts, spirting out portions of its contents analagous to the violent ejection of the contents of the stomach in the inflammation of that viscus, or in the inflammation of the œsophagus.

Now succeeds a discharge of a dirty brown water, with a sufficiency of bloody turbid matter to give it that dark tinge, and at length a black matter is thrown off with the fluid ejected, and which sometimes falls to the bottom of the vessel; in other cases it floats on the surface of the fluid. This matter I have observed to exhibit itself in different forms. 1st. In flakes, like tinder, floating on the fluid discharged; this I believe to be the effect of a sphacelus of the villous coat of the stomach, and which I have remarked is invariably fatal. 2d. It appears to be discharged in the form of blood and mucus which gradually subsides. But

the more common evacuation is that of the 3d, the coffee-ground discharge, and which immediately falls to the bottom of the vessel, precisely resembling the appearance of coffee-grounds, and which appears to be made up of broken or dissolved blood. After death, this has been traced to the coats of the stomach; in other instances it has been followed into the gall bladder and biliary vessels, and is supposed to be discharged from the liver through the biliary vessels themselves, as if, to use the expression of Dr. Saunders, (see his Treatise on the Liver) it was blood hurried through the liver before it has time to undergo the changes necessary to be formed into bile; in this manner I have seen it discharged in quarts; in some instances, too, of diseased liver, I have seen such discharges, precisely like the black vomit of yellow fever. Another proof that the black vomit chiefly consists of blood is, that the strength rapidly and manifestly declines with every discharge from the stomach, the powers of life are sensibly wasted by each successive evacuation, as we ascertain by the loss of pulse, and the coldness of the extremities.

Hemorrhages, too, now frequently take place from the bowels, gums, lips, tongue, nose, ears, and blistered surfaces.

The proximate cause of this form of fever I consider to be an inordinate irritation of the system, the effect of the tropical heat acting upon the northern man, or of contagion, which has a definite or specific operation upon the body. When the disease proceeds from the first of these sources, and assumes more especially the character of the ardent fever, or *causos*, as it does in the insulated individual, and is not derived from contagion, our indication is, in that form of fever, to reduce the violent excitement of the system by the means of depletion already pointed out in cases of simple excitement; but when it proceeds from the second source mentioned, from contagion, as is frequently the case during war, when a great number of soldiers and sailors are suddenly transported to the tropics, and the air is rendered impure by their crowded condition, and thence a septic state of system is induced, the indication is to moderate the action of this poison upon the system; in other words, to place the body, like the ship exposed to a hurricane, in a condition to sustain its action and violence, with as little injury as possible to the vital organs, for you cannot annihilate the poison, but, like opium or arsenic, it will continue to operate until it wears itself out. Our object,

then, is to prevent it from wearing out the system at the same time. For this purpose, then, open all the excretions, and keep them so until the enemy shall have disappeared; not that you evacuate the morbid material, as some have supposed, though you do more or less of this, too, in all probability, but because in this open state of the excretory organs, and division of the excitement, the poison operating does less injury, because there is less fever, and fewer sources of irritation to augment the fever constituting the disease; for the retention of fæces in the bowels, and of the perspirable matter from the suppression of the discharge by the skin, cannot fail to increase the violence and to add to the malignancy of the disease, inasmuch as these sources of excitement, of themselves, are frequently the causes of fever. But in the means we employ for this purpose of obviating febrile action, and in the evacuations we make use of, let us not conspire with the enemy in producing a destruction of the vital powers. Venesection, therefore, when advisable, as is the case even in cases of fever from contagion, as we have seen, must be done early, cautiously, and judiciously, both as to quantity and repetition. We are not, however, as Dr. Rush has recommended, to run the body under bare poles. To continue his figure, we should always keep enough sail to enable us to lay-to during a gale, but not to be altogether at its mercy, or we assuredly shall be overwhelmed; for blood-letting has certainly been a fatal practice; death has very generally followed in the footsteps of the physician that has adopted it. As I have said before, upon another occasion, the indiscriminate use of the lancet in the yellow fever, as it has been pursued and recommended by some writers and practitioners, is adding the sword to the pestilence—it is putting arms in the hands of the enemy for our destruction. Most generally, the lancet may be dispensed with. In this country, as well as in Spain, particularly in Barcelona, venesection was a fatal practice; it was found otherwise by one of our navy surgeons, Dr. Cooke, in one of our armed ships. The best and most successful practice, in my opinion, consisted of mild cathartics, such as Glauber salts and castor oil, aided by laxative injections; it is improper to wait for a slow cathartic. You, doubtless, recollect my statement of the success which attended the practice of Richardson Underhill, of this city, and of Thomas Penrose, John Vaughan, and William Clifton, of Philadelphia, in the epidemics of the two cities; and that these good Samaritans

cured a much greater number of the sick by their castor oil, their catnip tea, their eupatorium, and their sage, than the graduated doctors of Europe or of this country, that directed what were denominated your Herculean remedies, the lancet, and their 10 and 10, their jalap, and their calomel.

Emetics, in this disease, are universally proscribed by all who have been particularly conversant with it, as a fatal practice, and in some instances ending in an unceasing vomiting. At this we are not surprised when we look at the cause of the disease, its violent action upon the nervous system, and the plentiful supply of nervous influence bestowed upon that organ, and the connexions it holds with the cœliac plexus and ganglions, and with the other parts of our frame. The practice found most beneficial after cathartic medicines have operated, is to relax the surface by sudorifics. These, when the bowels have been opened, are among the most beneficial means we can employ. This was the practice introduced by Dr. Warren, of Barbadoes; he learned it from a sailor. The same was pursued by Dr. John Bard, by Dr. Samuel Bard, and myself, in the endemics of our city. This consists, first, of washing the body with vinegar and water, applied cold or warm, according to existing circumstances; cold, if the skin be hot and dry; tepid washing and fomentations, if the body be moist but too much heated. Now the *sp. minder.* and laudanum, or the draught of Riverius may be advantageously administered, and repeated every two hours; repeating also the cold washing as circumstances may call for it; and giving frequently a cup of toast-water, or some diaphoretic drink. It is necessary to observe caution in the continuance of the sudorific mixtures when a free discharge by the skin is obtained, and not to continue them beyond the first or second day, lest the stomach be too much debilitated. Antimony is used by some, but this is hazardous in its operation. Mercury is bad for the same reason, in part. In warm climates, it is said to be a beneficial practice. This may be so where hepatic affections so extensively abound; but not so in our climate; with us it has been a fatal practice.* In like manner, it has been found injurious in Spain.

Blisters to the region of the stomach should be early applied,

* See my letter to Dr. Currie, of Philadelphia, in the Transactions of the College of Physicians of Philadelphia.

to prevent the disturbance of that organ, and to counteract the inflammation with which it is apt to be affected in that disease. If the yellow fever should again visit us, it will be one of my earliest applications. It is useful, too, in allaying the irritations of that viscus, such as hiccup or black vomit. They are also serviceable applied to the limbs for the purpose of removing fever, and diverting the irritations of the system to a part. They are useful when applied behind the ears, and between the shoulders, to relieve the brain when congested or greatly disturbed.

When black vomiting has been induced, have we any means of relieving that deadly symptom? As I have already observed, there are various anti-emetics. The most effectual of these is the mixture of lime-water and milk. My first application of it was in 1798. I was led to the use of it in that disease, by the beneficial effects I had derived from it in dyspepsia—it succeeded admirably, aided by spirituous fomentations. There was a public recommendation of it by Dr. Samuel Bard and Dr. Charlton: it was then communicated to Dr. Rush, who also, in his works, testified to its success. (See my letter to Dr. Currie.) Lime-water and porter may be used; or brandy and water, and spirituous fomentations. Cayenne pepper also is good. It is Dr. Wright's prescription. Ice has also very happy effects. Spiced wine, with cinnamon, and blisters to the extremities may be advantageously resorted to. Let your patient's drink be cold water, toast-water, soda-water, mild teas of different kinds, as mint, catnip, snake-root, or boneset. Let his diet be altogether vegetable.

With these observations I conclude our view of the first class of diseases, in which we have had a very varied and circuitous course to pursue, and one attended with much embarrassment and difficulty. In the next class, the plegmasiæ, our path is more plainly marked. We may therefore, in allusion to the winding course in the one, and the clearly marked channel of the other, emphatically say—

“Farewell to Thames, all hail to Tyber's stream.”

LECTURE XXXII.

PHLEGMASIÆ—INFLAMMATION.

THE term *phlegmasiæ* is derived from the verb φλεγμαίνω, or φλέγω, *uro*—to burn. The inflammations or *phlegmasiæ* are thus defined by Dr. Cullen : “Febris synocha ; phlogosis vel dolor topicus, simul læsa partis internæ functione ; sanguis missus, et jam concretus, superficiem coriaceam albam ostendens.” The buffy coat, I remark, is not essential, for inflammation exists without it ; and the buffy coat frequently exists without inflammation, as in the last stage of malignant fevers, and in pregnancy. Inflammation is a figurative term ; it is applied to this diseased condition of the human body, from a supposed accumulation of fire in the part affected, which was the opinion formerly entertained on this subject—a subject, too, upon which much speculation has been indulged, and various opinions and doctrines formed and propagated, as you will perceive by referring to the writings of Boerhaave, John Hunter, Burns, John Pearson, Cullen, Wilson, and Thompson. And to the same writers I refer you, both for the various doctrines which have been entertained upon this subject, and for the best records of facts or phenomena which this subject presents. Before we proceed to notice the various doctrines that have been promulgated upon this much disputed subject, or to institute any inquiry into their truth, let us adopt the same procedure that we have pursued in the preceding class of fevers, that is, before we involve ourselves in the speculations that have prevailed, let us look at the facts, the phenomena, which inflammation presents to our view. If those are sufficient to reason from, we shall, in that case, soon come at the clue by which those phenomena are to be unravelled, those general principles which

arise from the facts when carefully assembled ; for as I have before observed, general principles are nothing else but general associations of facts. Principles constitute the bond of union between those facts. "Even the laws of nature," say Reid and Stewart, "are nothing else but the most general facts relating to the operations of nature which include a great many particular facts under them." How far then are the phenomena upon this subject sufficient to lead us to general results ? Let us for a moment attend to the phenomena of inflammation. Suppose a splinter to be applied to any part of the body—the prick of a pin, a needle, lancet, or even the proboscis of a fly, or the sting of a musquito, or the application of a blister : what takes place ?

1st. We are sensible of pain or irritation, some extra impression of the parts, increased sensation, not increased sensibility, as Dorsey calls it ; this last frequently follows but does not precede. Avoid the abuse of terms, for remember, to a certain extent we may say, with Blair, "words are ideas."

2d. We see the part reddened. We see red blood circulating where it did not circulate before, as in the eye and other membranous parts ; and where red blood circulated before, but the globules were not perceptible, now with the aid of glasses we see larger globules actually flowing in the vessels, and the vessels themselves are enlarged.

3d. We shortly after perceive tumour or swelling.

4th. The heat of the part is perceptibly increased and accumulated, attended with a sense of burning to the patient, and evident to the by-stander.

5th. These symptoms are followed by a throbbing or pulsation ; vessels now pulsate that never did before, that is, as it regards our feelings or our consciousness. This is especially observed in the most sensible parts of the body, as in the fingers, where the nerves are numerous. The cause of the irritation being withdrawn, removed, or worn out, or the impression not being very considerable, those symptoms soon subside ; but if the cause be continued or the effects be severe, and

6th. The irritation be continued, it extends beyond the part to the vicinity—to the whole limb, following the course of the nerves in lines which are observable. To the patient the sensation communicated, is that of hot wires passing through the parts affected ; and

7th. The whole system becomes involved in the irritation produced, and that in proportion to the sensibility of the system, and the sensibility of the parts. Fever ensues with all the characters of synocha, viz : the hard pulse, white tongue, diminished excretions, or,

8th. A new increase of excitement takes place in the part, for a new *vis à tergo* is now acting upon the inflamed vessels—they become highly injected, for the great syringe is now operating—I mean the heart and aorta, with the other large vessels, are all now highly excited ; a great determination takes place to the seat of irritation ; a disproportionate quantity of blood is carried to the part, and accumulation or congestion is the consequence—pain, throbbing, tumour, heat, and redness, are all increased. Such are the general symptoms of inflammation in its first stage, as occurring in most parts of the system. They have been long since noticed, even as early as the time of Celsus. “*Notæ vero inflammationis,*” says that author, “*sunt quatuor; rubor et tumor cum calore et dolore.*” These several forms or grades of inflammation proceeding, terminate in different ways.

1st. By resolution, in which all those symptoms disappear, either suddenly or gradually. This event takes place either when the degree of irritation is very inconsiderable, or the remote cause is suddenly withdrawn.

2d. It may terminate by an effusion from the inflamed vessels. This effusion may consist (1) of blood. Of this we have examples in ophthalmia, catarrh, dysentery, inflammation of the lungs, viz: peripneumony—two cases of this latter disease ending in such effusion, are related by Carmichael Smyth, as communicated to him by Dr. Cullen—in one, blood was extravasated, in the other, a bloody serum was poured out. Analogous cases are also related as taking place after typhus fever. A second form of effusion is that of serum; it is poured into the cavities of the body, as in the head, the chest, or belly, producing dropsy in those cavities ; and in some instances almost immediate death. The late Dr. Charlton, of this city, died of such effusion in the chest, under an attack of pneumonic inflammation. (3d.) Pus is also effused as the result of inflammation, called suppuration. (4th.) Another discharge is that of a material bearing some resemblance to pus, but which mostly is considered to be coagulable lymph. In such cases adhesions take place, for vessels readily

strike through such media. This effusion shows itself in the trachea, bronchiæ, lungs, and contents of the brain and belly. Another deposit which I have seen as the effect of inflammatory action, is earthy or bony matter, as from the kidneys.

3d. Inflammation when seated in the nicely organized structure of a gland, may end in a permanent obstruction of the part called a scirrhus of such gland. This obstruction may again end in an open ulcer, or as it is absurdly called, a cancer of the gland. Goitre is thus induced. This disease is usually ascribed to snow-water. I believe it is owing to the alternations of atmosphere to which the inhabitants of the Alps are exposed. At the same time that other causes may possibly have an agency in the enlargement of those glands of the neck. I have accordingly placed goitre under the head of scirrhus in my nosology.

4th. Inflammation terminates in sphacelus or gangrene—in the bone, this death of the part is denominated necrosis.

But inflammation exhibits a different train of phenomena, depending on peculiar circumstances. What are these circumstances? Inflammation varies in its operation, phenomena, and duration, depending on the structure of the part, the seat of the inflammation.*

1st. Inflammation exhibits peculiar phenomena when seated in the cellular membranes, and the fleshy, muscular fibre.

2d. It shows another train of appearances, and that throughout

* Mr. Hunter divides the body in two parts.

1st. The circumscribed cavities, organs, and cellular membrane connecting them.

2d. The outlets of the body called mucous membranes, as the ducts of the glands, alimentary canal, and similar organs. These two parts he makes the subjects of different inflammations. His inflammations are, first, adhesive; second, suppurative; third, ulcerative. The first, that is, adhesive, takes place in the first class of parts, the circumscribed cavities and organs and cellular membrane, that is, where deeply seated. Suppurative in those superficially seated. Ulcerative in the second class, the outlets of the body. There are objections to this view. He does not distinguish between the texture of the organ and its membranes inclosing it. Even deeply seated suppuration will take place. The adhesive, too, will take place in those membranes near the surface, though he considers them more liable to the suppurative. And again he makes a very absurd distinction between suppurative and ulcerative, for the latter always implies suppuration. Nor are the mucous membranes so likely to ulcerate as other parts—nor do his distinctions provide for all the various forms and consequences of inflammation. I have therefore, adopted a different arrangement, and I trust, one no less subservient to practice.

its whole progress when this inflammation is seated in the mucous membranes, or in the excretory vessels composing the various excreting surfaces of the body.

3d. It is again peculiar in its phenomena when seated in those dense membranes which are internal, having no excretion or exit from the system, called serous membranes, by Bichat; and

4th. Inflammation differs in its nature and consequences when seated in those organs which are supplied with a great number of nerves, which of course, possess great sensibility, and are thence intimately connected with life and health. I beg your attention while I endeavour to illustrate these characters of inflammation.

Inflammation, I observe, has its peculiar characteristics when seated in the cellular membrane, or cellular tissue, as is the fashionable language. Observe, I include under this head, not only the cellular and adipose membrane, which is seated in the integuments below the skin; but also as it exists in the parenchyma of the various viscera contained in the different cavities of the body; even, perhaps, as seated in the substance of the brain. For as it regards practice, this distinction is highly important, as it leads us to look for inflammation in the brain when the usual phenomenon of inflammation might not otherwise point it out. Accordingly we have seen in the history of fevers that inflammations terminating in abscesses have not been discovered until after death. (See Pringle.) Not so in membranous inflammation of the brain. I say, I include the parenchyma of the lungs. I include the cellular membrane, as seated in the glands of the system, (and in those organs resembling glands in their structure, whether with or without excretory ducts, as the uterus and spleen,) as opposed to membranous inflammations. Observe, the glands and some of the viscera are included as having a loose, spongy texture, being chiefly made up of cellular membrane, uniting the blood-vessels and nerves through all their infinitely numerous ramifications. Under this head I include the liver, spleen, pancreas, kidneys, uterus, ovaria, testes; the tonsils, the thyroid gland, the parotid, the cervical, the axillary glands, the mammæ, the cellular membrane, &c., distributed in the muscles; the muscular fibre itself, which is considered by many physiologists as a condensed cellular membrane; the internal texture of the bones, the cancelli of the bones, in which, like the inflammation of the periosteum, inflammation frequently ends in necrosis.

2d. Under the head of external secreting membranes, and excreting surfaces, I include the skin, the palpebræ, the tunica adnata, the meatus auditorius externus, the mucous membrane lining the nares, fauces, larynx, trachea, bronchiæ, surface of the lungs, the pharynx, œsophagus, stomach, gall bladder, and biliary vessels, the intestines, surface of the whole intestinal canal, also of the urinary organs, ureters, bladder, urethra, corona glandis, uterus, vagina, labia; even the excretory surface at the ends of the fingers, where the skin covers the nail, the seat of paronychia, or whitlow, vulgarly called runrounds. All these several parts have an exit from the system, of the secretions which take place upon their several surfaces. Under the head of the internal membranes, where the secretions are of a serous nature, different from those enumerated, and have no exit from the body, no discharge of the matter secreted, I include a great number, beginning with the membranes constituting the coverings of the brain; those composing the internal coats of the eye, those of the thoracic viscera, whether lining the chest or its productions covering the different viscera; the pleura lining the ribs, and covering the lungs; the pericardium, the covering immediately investing the heart, the mediastinum; the abdominal membranes, the peritoneum lining the belly, or involving the different viscera. The membranes found in the pelvis, as the peritoneum covering the bladder, the uterus and intestines; the membranes inclosing the testes, the fasciæ covering and binding the muscles; those constituting the bursæ mucosæ, or sheaths of the tendons; those constituting the capsular ligaments of the joints and pelvis, as the sacro iliac and sacro sciatic ligaments; the periosteum lining the pelvis covering of bones of the extremities, and the pericranium.

I have also said that inflammation is attended with peculiar phenomena when seated in organs plentifully supplied with nerves, as the skin, mouth, fauces, stomach, intestines, bladder, and uterus. I shall now proceed to enumerate the particular phenomena which attend inflammation when seated in these four classes of organs. When seated in the cellular membrane, the adipose membrane, or in the fleshy muscular fibre, inflammation is attended with more tumor; the parts being of a relatively loose texture, they are more distensile and elastic; and they exhibit more pulsation from the same cause. This species or variety of inflammation was known to the Greeks by the name of phleg-

mon, (from φλεγω, uro.) Galen has well defined it in his work *De Tumoribus Præter Naturam*, Lib. i. cap. 2. "Hoc phlegmones nomen Græcis dici consuevit, de carnosis partibus; majorem in molem, cum tensione, renixu, dolore pulsatorio, calore et rubore, extuberantibus." He should have added to this enumeration the usual termination of inflammation thus seated; viz. by suppuration or abscess. This inflammation, too, is generally of longer duration; the parts being less sensible, its termination will not be so rapid. It is also on the same account less painful than some other inflammations to be noticed. The external parietes, at the boundary of the tumor, being inflamed, form an union of many of its fibres by cohesive inflammation, making a kind of wall; but in this the inflammation is less violent than that in the centre of the tumor. In the centre, where the inflammation is most active, effusion at length takes place of purulent matter; a viscid secretion of considerable consistence, corresponding with the enlarged dimensions of the vessels, and this is sometimes mixed with blood. This matter, acting as a foreign body, excites the absorbents. The skin adjoining the matter is rendered thin; it points and finds an exit in that direction where there is least resistance; not that it finds the surface by an instinctive operation, as Dr. Good supposes. Instinct does not always direct it to the surface: instinct is generally unerring. The other parts of the cavity show similar changes. If in the lungs or liver, considerable removals of their substance takes place, leaving large cavities. I have seen a case of this kind in Bridewell, another in the New York Hospital, and a third in Cherry street. The two first recovered, the third died. I examined him after death. The liver, diaphragm, and lungs were all consolidated; there was a large aperture, sufficient to permit my arm to pass through. In this last case, too, the inflammation was so insidious that a very eminent and experienced physician did not detect the real state and nature of the disease, but treated it as a case of hypochondriasis by gum pills, and the decoction of the woods. Diseases of the liver were then not as well understood as at this day. In another instance I have seen a large portion of the rectus muscle carried away by absorption, the effect of the stimulus of an encysted tumor, acting upon it as a foreign body. This tumor was removed, and disclosed the ravages it had created upon the neighbouring rectus muscle. I have seen another case of the gastrocnemius

nearly excavated by an abscess. Upon examining the interior of an abscess this is not all; the cellular membrane which first made the seat of the tumour, is also in a great degree removed, and pus found in its place, mixed with some remaining fibres, probably of vessels. This little mass of vessels which remain, is vulgarly called the core of such abscess; i. e. a mass of the vessels which were perhaps the first seat of the inflammation. This core is kept in its place by a few of the fibres or remaining vessels still adhering to particles of the abscess. Hence time is required to remove this core from its connexions. It is important, too, to remember that inflammation, when thus located in cellular substances, is less painful, and of course more insidious, as in the liver, lungs, and brain. The pulse, too, manifests it less than when seated in the mucous, the dense or serous membranes; and still less than in the more sensible organs that have been enumerated; as the skin, the stomach, uterus, &c., the whole symptoms of general irritation are less. Indeed we may observe, that phlegmonoid inflammation scarcely ever appears but in the cellular membrane, or in those organs abounding in it, as the brain, lungs, liver, kidneys, muscles, as the *psoæ*, producing the *psoas* abscess. Their loose texture, in a particular manner, admits of this extraordinary distension—this tumor, the pulsation, and secretion or effusion of a fluid of the consistency of pus, having globules nearly resembling in their size the globules of blood.

I believe such purulent effusion rarely appears otherwise. I say rarely, for I have seen, in some instances, a purulent secretion from the surface of the intestines, floating over the surface after enteritis. We also sometimes find an analogous enlargement of the vessels upon the surface of the lungs, and a purulent fluid discharged from the surface, and proving fatal, exhibiting all the symptoms of phthisis; and yet upon examining the lungs after death, no abscess, no vomiceæ, no phlegmonous collections are to be found, not even the least appearance of ulcer. The next form of inflammation is that which is seated in the secreting membranes, especially those pouring out mucus, and which have an outlet from the system. Those membranes are more soft or spongy, less dense than the internal membranes, and they have a villous surface supplied with numerous follicles pouring out fluids; these, being of a mucous nature, defend those surfaces from any acrid materials that may flow over them. We have examples of these secreting

membranes in the lining of the nares, fauces, bladder, urethra, and uterus. The effect of inflammation, when seated in those membranes, is an increased thickness of them; the villous surface becomes red and spongy, with great heat and soreness; it is attended with but little acute pain, except such as arises from the acrid fluids pouring over their inflamed surface. The fluid itself, which such membrane secretes, becomes changed; instead of being ropy and adhesive, it becomes thin and acrid, losing its tenacity, and excoriating the neighbouring parts; now at length it becomes somewhat purulent, and then soon returns to its original consistency and qualities. As there is not much acute pain, there is, therefore, comparatively little fever, except when the inflammation becomes deeper seated, reaching other organs beneath the part primarily affected. Fever is not generally produced to a great extent by the inflammation of mucous membranes, (for the inflammation to a degree at least appears to be moderated or diminished by the discharge,) though fever produces inflammation in them. When terminating favourably, the discharge, from being first thin and acrid, becomes purulent; afterwards it recovers the properties of a bland mucus, with all its tenacity and transparency. But when the inflammation is greater, it ulcerates the membrane itself, and sometimes even extends to the parts deeper seated, producing abscess or phlegmonoid inflammation; even sometimes ending in gangrene, as in the bladder, intestines, womb, &c., but this is not the usual termination of inflammation seated in the mucous membranes. This inflammation of mucous surfaces is also oftentimes chronic, while the preceding, and those which are to follow, are acute; with some exceptions, as when dense membranes, or even the cellular, are the seat of scrofula or of lues, even the dense membranes, as well as the cellular membrane of glands, then become affected with chronic inflammation, depending then, however, more upon the nature of the cause than the structure of the part, the seat of the inflammation. In the inflammation of mucous surfaces, sponginess, redness, and great sensibility remain in the parts affected; the fluid secreted remaining sharp and corrosive.

The third sort of inflammation is that which is seated in dense membranes, which are internal, having no external outlet for the matter they secrete, and the matter secreted is thin and serous; from their dense structure, Haller thought them insensible, and incapable of inflammation; he even thought a pleurisy to be seat-

ed in the intercostal muscles, and not in the pleura. Haller was a much better anatomist and physiologist and poet, than physician. It is now ascertained that those membranes, as of the brain, lungs, peritoneum, &c., when inflamed, are exquisitely alive to impression; the sufferings of a periostitis are inexpressible. In the membranes of the joints, the same sensibility is manifested when inflamed, especially upon the admission of air to the cavity of the joint; this being a stimulus to which they are unaccustomed. I have seen a very violent degree of inflammation induced in the cavity of the knee joint, by discharging a large collection of water from it. The operation was performed by Mr. Bennett and John Bell. Although it was performed in such a manner as to make the least possible wound, and with a valvular opening allowing the water to flow off, and as far as possible to exclude the air; a most violent inflammation ensued, and ultimately proved fatal. Mr. Bell then declared that this event had so frequently taken place, that he would open no more joints. The symptoms of inflammation in dense membranes, are violent pain and irritation. Why more so in these than other membranes? Because of the firm unyielding texture, resisting the distention that takes place in other parts, from the quantity of fluids loading the inflamed vessels. Great fever is of course to be expected as the consequence of such irritation; the membrane itself is thickened and becomes opaque; an excretion of a matter like lymph is poured out upon its surface, sometimes a turbid serum, and in other instances, bearing a resemblance to very thin fluid pus. An adhesion to the adjoining inflamed parts also frequently takes place; in some cases I have known the parts to slough, as in the case of an inflamed testicle, in which case the coats of the testis were peeled off in succession, like the coats of an onion. In a pleurisy, the patient suffers a severe pungent pain, with a short and painful cough, the pleura becomes thickened, and often a gelatinous effusion and adhesions are the result. In some few cases, such pleuritic inflammation ends in serous effusion or hydrothorax, while, in still fewer, I have known it to end in sphacelus. So, in like manner, peritoneal inflammation is attended with intense pain, followed by gelatinous exudation, adhesion, serous effusion, and sphacelus. In inflammation of dense or serous membranes, as Bichat calls them, the pulse is quick, hard, and small; the fever too attending it, is greater, as we see in inflammation of the mem-

branes of the brain, periostium, &c. Inflammation is also peculiar in parts highly organized by nerves, and thence possessing great sensibility, as in inflammation of the skin, the mouth, fauces, stomach, intestines, bladder, vagina, uterus. Inflammation in either of those organs is painful, from the irritation applied, in consequence of the great sensibility of the parts. Excitement is then reproduced throughout the whole system; it is rapid of course in its termination, for the vital powers of those parts are soon worn out, and sphacelus, the common consequence, is produced. We see examples of this sort in the skin; as sphacelus from blisters, especially in children, or in fevers where, from their long application, the vital principle is already impaired, also, sphacelus from erysipelas; hence, too, the fatality of burns, especially in the sensitive systems of children. In the fauces, in like manner, inflammation rapidly ends in gangrene. The inflammation of the intestines in dysentery, as we have seen, is in some instances rapidly fatal in this manner, by terminating in sphacelus; in the inflammation, too, of puerperal fever, the same result is not uncommon. Beware how you deceive yourselves by cold extremities, a pale face, or a small pulse; do not by them be deterred in the beginning from an active antiphlogistic treatment; on the contrary, remember the cause and seat of these phenomena, and let them teach you that they are the very reasons for your greater activity in the use of those means that are indicated; and remember, too, that the first six hours are your time of action, and of securing your patient's safety. It is important, therefore, to know these facts, not only as it regards their symptoms, but your cure. The natural termination of those various inflammations leads to important conclusions, in this respect: they teach us, if we cannot readily obtain resolution by active and early measures, to guard against adhesion, and especially gangrene and sphacelus, for we have seen,

1. That when inflammation is seated in the cellular membranes, the tendency to suppuration is scarcely to be counteracted.
2. That when seated in mucous membranes, the inflammation is less severe and more manageable.
3. That in dense membranes adhesion is to be expected.
4. That, seated in parts highly organized, there is no time to be lost, or it will end in gangrene or in sphacelus, as in the treatment of the inflamed part locked up in the stricture of hernia.

LECTURE XXXIII.

PHLEGMASIÆ.—INFLAMMATION.

INFLAMMATION not only varies in its nature and consequences, according to the structure and sensibility of the parts in which it may be seated, but it also varies in its character, depending on its remote or exciting causes. Ophthalmia, for instance, may proceed from cold; it may proceed from scrofula, or it may be the effect of syphilis. According as it proceeds from any of these causes it exhibits a different train of symptoms; is of long or short duration; and requires a different mode of treatment. In that from cold, it is attended with fever; in that from scrofula or syphilis, it is most generally without fever, or it is comparatively mild. That from cold is of short duration; while that from the other two causes is tedious, and does not yield to the same treatment. In that from cold, the antiphlogistic treatment is called for, and alone affords relief; while in the other, the lancet and other means of depletion are of little avail, and the disease is only to be removed by the antidotes to the peculiar vice with which the system may be affected. For the most part, the physician, by attention, will readily know the one from the other, by the more active form of the one, and the less violent symptoms of the other.

But unless we advert to the cause we shall be unsuccessful in our treatment of this disease. Inflammation of the throat may in like manner arise from cold. 2. Contagion, as in cynanche maligna. 3. Syphilis. 4. Or even from mercury. The two first and the last, i. e. from cold, contagion, and mercury, are attended with fever. That form of syphilis is most usually without fever; but the latter calls for peculiar treatment. Mercury alone is the remedy. But if mercury is the source, other means must be directed.

Again, glandular affections, as obstructions of the lymphatic glands of the neck, may proceed from, 1. Cold; or from, 2. Teething; 3. From scrofula; 4. Or from syphilis; 5. From porrigo—scald head. The two first are attended with more or less of fever; the other none, except what the humours themselves may create. Inflammation of the joints may also arise in like manner from cold, from gout, from scrofula, or from syphilis. Mr. Pott's skill became celebrated for detecting the last mentioned cause in two cases which fell under his care, of disease of the joints. We see the same illustrated in an inflammation of the skin, that it exhibits different phenomena, is more or less dangerous, and has different terminations, according to the causes which produce it; and consequently that it demands, according to the nature of the causes producing it, a different mode of treatment. We see erysipelas from cold, also from heat, from intemperance; we see it from gout; i. e. from an inflammatory habit of body, or from plethora; we see it in the form of an erythema, the effect of mercury; and we see it the effect of a general septic state of the fluids. To prescribe successfully, these causes must severally be kept in view in our prescriptions. Celsus has very justly said, "*Eum recte curaturum quem prima origo causæ non fefellerit.*" That he will readily cure diseases who is not deceived with regard to the causes of them. Such are the phenomena of inflammation; and by these circumstances they are influenced; viz. by the structure of the part in which it occurs, and the nature of the cause producing it.

Let us next briefly inquire, what are the several remote causes of inflammation. They divide themselves into the predisposing and exciting causes. The predisposing causes are,

1. Certain temperaments of body are more susceptible of inflammatory diseases than others; as the sanguine and nervous temperament.

2d. Debility, by producing great sensibility, predisposes to inflammatory diseases. Hence we see the same person more liable to a second attack, and of the same disease; i. e. this debility shows itself in the part as well as the whole system.

3d. Climate has its influence, as a predisposing cause. A climate in which many vicissitudes of weather occur, or a very hot latitude produces inflammatory diseases, as we see illustrated in our own climate, to which the character given of that of Pennsylva-

nia may with great truth be applied. Dr. Rush observes of it, that it is uniformly variable.

4th. Certain seasons of the year, for the same reason, as spring and autumn, predispose to diseases of an inflammatory character.

5th. Manner of life: a full habit of body, our beef eaters, and five-bottle men, are the candidates for gout, as well as other diseases of plethora and inflammation. They not only act by the fulness they create, but by the indirect debility which they induce.

6th. Females are more liable to inflammatory diseases than males, both from their natural delicacy and sensibility of frame, as well as that sensibility which is the effect of confinement and sedentary habit of living. Cynanche tonsillaris, pneumonia, ending in phthisis and hemorrhage from the lungs, come from the same cause. Rheumatisms are of much more frequent occurrence in the female sex than in ours.

7th. Time of life has its agency in this respect. Infancy and childhood, in an especial manner, predispose the body to certain inflammatory diseases. It is the preternatural sensibility of infancy that renders them so liable to anginas, to croup in particular, and to pneumonia; especially those inflammatory diseases which are seated in the mucous membranes, are the predominant diseases of that period of life.

8th. A plethoric habit of body predisposes to the same class of diseases; for the secretions in such being more abundant, they are also, by the application of cold, or other exciting causes, more easily checked; and in such habits of body the inflammation induced is more violent.

The exciting causes may be said to embrace every means of quickening the circulating system.

1st. Mechanical injury, as (1) wounds inflicted by instruments; the wounds from a ball; from splinters; even friction of the thighs by riding or walking, proves an exciting cause of inflammation. (2) The irritation arising from calculi, as in the gall-bladder; biliary ducts; kidneys; ureters, or urinary bladder; or deposited in other parts, as the lungs.

2d. Cold partially or suddenly applied.

3d. Heat, either from the direct rays of the sun, or by fire.

4th. The alternate operation of heat or cold, as in the changes of atmosphere.

5th. Animal stimulants, as the stings of various insects.

6th. Vegetable stimulants, as turpentine, the effluvia of the cashew nut, *anacardium occidentale*; the fœtid liquor exuding from the *urtica urens*.

7th. Chemical, or metallic stimulants, as the oxydes of arsenic, mercury; the mineral acids, as the nitric, muriatic, and sulphuric acids, caustic alkali, quicklime.

8th. The peculiar acrimony of diseases, as syphilis, scrofula, and especially,

9th. The diseases of contagion, of which there is a great variety, as measles, catarrh, small-pox, scarlatina, &c.

10th. The irritation of fevers, and especially synocha; and,

11th. Obstructions of vessels; that is, partial determinations taking place, as in fevers, to particular organs, as to the brain, lungs, &c., especially when they have before been the seat of irritation. These local inflammations supervene as the attendants on fever. Thus, too, we see glandular swellings in the advanced state of fevers, and other diseases, as from syphilis, scrofula, typhus fever, plague, or yellow fever. But obstructions are also, in many cases, the causes, as well as the consequences of inflammation as in the *mammæ*, when obstructed sometimes. Such obstruction creates inflammation, and that, too, whether it be a recent obstruction from milk, or it may have been an old scirrhus. In either case it may be the cause of active inflammation. In this way the former may end in abscess; the latter in cancer; i. e. ulceration, the effect of inflammation in the obstructed part.

Again, we see collections of blood in the hemorrhoidal vessels not only painful in themselves, but such is the irritation excited that a phlegmon, and that terminating in fistula in ano, are the consequences. In like manner, accumulation of blood in the uterine vessels, the effect of suppression of the menses by cold, or a sudden check of the lochia, not only creates great distress and soreness, but puerperal fever; i. e. uterine and peritoneal inflammation. In some cases, scirrhus and cancer uteri are the consequences of the natural cessation of the menses; and such inflammation, like that affecting the liver and lungs, is frequently insidious in its approach; or, as I have said before, speaking of the inflammation in mucous membranes, it is perhaps, partially relieved by a degree of fluor albus, that is frequently the attendant upon such uterine obstructions. An analogous suppression of accustomed excretions from the surface of the body, from the intestines, from

the biliary canal, or from the urinary organs, by creating a new stimulus to the parts, and indeed to the whole system, also produces inflammation and its consequences. Even sphacelus is in this way not unfrequently the effect of the suppression of urine.

Thus, too, we see the check given to the excretions from the throat, trachea, lungs, nose, lachrymal glands, produces inflammation of those organs. Even the glandulæ meibomii obstructed produces psorophthlmy, or perhaps the hordeolem, or common sty. Indeed, all such obstructions become the immediate causes of irritation, by creating a fulness of the vessels of the parts, and thence extending that irritation more or less to the whole system, depending upon the extent of the connexions which such part may hold with the general system.

Having taken this view of the phenomena and remote causes of inflammation, we are prepared to inquire into, and to appreciate the different opinions relative to the nature of that diseased condition, and I trust, too, to perceive their insufficiency, as that of Dr. Hoffman, after him adopted by Dr. Cullen. They supposed the proximate cause to consist not only in increased action of the blood vessels, but also a spasmodic stricture of their extremities. This spasm, as in fevers, may be the consequence, but not the cause—it may be an aggravating circumstance, but it is not essential to inflammation. The distended vessels may be spasmodically affected, or they may not be. Therefore, such spasm is not essential to the inflammation any more than it is essential to fever; or that spasmodic action in the trachea is essential to the inflammation of the membrane lining that tube, yet it is a common consequence in all. But let us not confound causes and effects; let us not identify causes with consequences. According to Dr. Boerhaave's view of this subject, inflammation consists in what he denominates an error loci; that is, that the small vessels containing blood, which vessels did not before contain it, are the seat of, and constitute inflammation. This doctrine is certainly a near approach to the truth, as corresponding with the phenomena we have seen; but alone it does not constitute the whole truth. Effusion of blood frequently takes place in the loose texture of the eye-lid, nay, in the very adnata of the eye; yet no inflammation attends or follows such effusion.

There is then, something more wanting, namely, an impacted state, a forcible entry of such blood vessels, so as to create

pain and irritation, is necessary ; and frequently there is no error loci in inflammation, except in as far as a disproportionate quantity of blood may exist in the very vessels in which it circulated before. Vacca, preceded in this theory in 1766. Mr. Latta's opinion is also somewhat original on this subject. He believes there is a deficiency of action in the part, and a paralysis of the vessels instead of spasm. These, too, are doubtless the effects, but not the causes of inflammation. The capillaries being overloaded, more or less of obstruction necessarily follows, and hence effusion is the consequence. Diminished action, however, although it may exist, is not the cause but the effect of such inflammation ; for it appears in the greatest degree when the inflammation is at an end, as illustrated in the experiments of Wilson : like Dr. Cullen's debility, it comes too late to be a cause ; it is only in time to be the consequence. Again, this paralytic state which Mr. Latta supposes to exist, is certainly very inconsistent with the local irritations attendant upon inflammation. It is altogether inconsistent with the pain, the heat, the redness, and the tumour attending the part. Paralysis of the part, like paralysis of the whole system, may be the consequence of plethora and obstruction, and probably is so. In like manner, too, the debility of the capillaries of the part, is not essential, as stated by Wilson. He, too, has the cart before the horse. The preternatural distention doubtless exists, but the other does not necessarily follow, from the facts he has adduced, any further than as a consequence of the distention ; but this debility has nothing to do with it as a cause of the inflammation, any more than debility is the cause of fever. It may be a predisposing cause in both cases ; but in this respect it is not essential to fever, nor to constitute inflammation. It necessarily, however, follows great distention and excessive action, but does not necessarily beget either or precede either. Another opinion has been lately advanced from that hot bed of speculation, Edinburgh. I refer to the view taken of this subject by Dr. Thompson, the Professor of Military Surgery, as contained in his volume of Lectures on Inflammation. That is, that in some cases the vessels acted upon, are readily distended by the exciting cause, constituting the passive inflammation ; in others they are not previously debilitated, and therefore resist the impulse a longer time, constituting the active form of inflammation. These are certainly facts not to be questioned—they, however,

merely show, as I have said before, that debility predisposes the part to be more easily acted upon, but that it is not essential to constitute the proximate cause of inflammation.

Let us next inquire for ourselves, and deduce such inferences as the phenomena we have seen will justify. We have seen an irritating cause applied to the part, producing inflammation; and that part, too, we have seen in some cases more susceptible of impression from the debility occasioned by a former attack; but this is not essential, as inflammation is produced without such preparatory condition of the part. As a child gets the croup, although it takes the disease more readily a second time, yet it has a first attack without any very peculiar sensibility of the part affected, with that alone which is peculiar to that early period of life. We have seen the phenomena of irritation or excitement in the part, the consequence of this irritating cause—we have seen redness, tumour, heat, pain, throbbing, vessels carrying red blood that never carried it before; and those which before were scarcely perceived to convey red blood, now very much distended with it, and carrying more than the ordinary quantity of red blood, as in the vessels of the adnata, and those which were the subject of Dr. Wilson's experiments. We have seen these evidences of irritation not confined to the part, but extending to the vicinity and even to the whole system; but this is not all, we have seen again the whole system reacting in the part diseased—loading it with blood, carrying to it a quantity altogether disproportionate to the size of its small vessels; and we have seen these small vessels under this extraordinary pressure, showing different terminations, according to the structure and functions of the part affected, the resistance it makes, and the cause keeping up the impulse. We have seen these inflamed vessels pouring out sometimes blood—serum—pus—a gelatinous effusion becoming the medium of adhesion between the part originally inflamed and the neighbouring parts; and we have seen the more sensible parts of the body ending in sphacelus. From all these facts we are authorised to conclude that the proximate cause of inflammation is a preternatural accumulation of blood in the part affected, exciting local or general irritation, according to the structure and sensibility of the parts and the nature of the remote causes and the time of their application. Observe, every temporary accumulation is not the proximate cause of inflammation; but kept up, it

will become so. General exercise quickens the circulation—partial exercise or the irritation of the part—mere friction from a flesh brush will increase for the time the quantity of blood in such irritated part; but even that partial excitement will, if continued, excite inflammation. Scratching, friction, will excite inflammation. General exercise will create general inflammatory fever; that is, inflammation of the whole system or synocha. Such is the best view I am enabled to take of the subject. It is the only one which in my opinion will explain the phenomena we have seen, and I believe it is the only one which will lead us to rational indications of cure, and the most effectual means of fulfilling those indications.*

* I perceive Dr. Good has come to nearly the same result. "Inflammation," he observes, "consists in an increased impetus and accumulation of blood in the vessels affected, accompanied with a proportionate swelling and sense of heat." (See Study of Med. vol. ii. p. 228.) This I consider as a strong confirmation of the views and doctrines which I have taught in this College from its first establishment, implying an increased momentum; that is, an increase of quantity or weight multiplied into its velocity.

LECTURE XXXIV.

TREATMENT OF INFLAMMATION.

FROM the view which has been taken of the proximate cause of inflammation, seeing that it consists in an inordinate quantity of blood, and the increased velocity with which it flows into the part, the seat of the disease, creating both local and general irritation, the following indications may be derived: 1st. To diminish the quantity of blood circulating in or obstructing the part affected; and, 2dly, thereby to prevent the debility, the effusion, whether of blood, serum, or coagulable lymph, the adhesion of parts, or the sphacelus, which such obstruction has a tendency to create. But it is to be remarked that there are two stages of inflammation, viz. the acute and the chronic, the active and passive, tonic and atonic, and that the means of fulfilling the indications of cure will accordingly differ in those two stages, at least they will differ as it regards the extent to which the remedies indicated are to be employed. The means of fulfilling the first indication, that of diminishing the quantity of blood circulated upon the part affected, and consequently of lessening the momentum with which it is circulated, are the following: 1. The removal or avoidance, as far as possible, of the remote causes, whether predisposing or exciting, if they are still present and operating upon the system, or upon the part, the seat of irritation, as in ophthalmia, the foreign body must be removed, the syphilitic matter must be counteracted. 2. By bloodletting, general or local, which both lessens the quantity of blood, and the force or impetus with which it flows; for the momentum and quantity are generally in proportion one to the other; or, to speak more accurately, the momentum con-

sists of the quantity multiplied into the velocity. This evacuation, too, is especially important, when the inflammation is seated in parts of the body possessing great sensibility, or in parts intimately connected with life, for the reason already assigned, because more violent, and thence more rapidly exhausting the vital principle. But, in the use of this evacuation, we must observe some caution, regarding, not only climate, season, constitution, time of life, stage of the disease, &c., but the character of the disease itself, as in the local inflammation sometimes attendant upon typhus fever. But in recent injuries, the system, being under no other influence than pure synochal fever, or a purely local injury, bloodletting may be used with the utmost freedom, local and general, by opening a vein, or the division of an artery, or by the various modes of local bloodletting, by leeches, scarification, and cupping. In such cases, remember,

"A little bleeding is a dang'rous thing,
Bleed free, or open not the vital spring."

3d. Other evacuations are indicated, not only with the same intention as bloodletting, but for the purpose of transferring excitement, and changing the determination or current of the fluids from the part affected to the exhalent surfaces, upon which those remedies are to operate. Active cathartics, such as the saline, or calomel and jalap, have a double operation in this respect. They not only act as so many lancets, or trocars, drawing off the fluids of the system, but they create new and strong impressions, new places of rendezvous; they divert the enemy from the part they are ravaging, and attract them to other and new objects of attention; we thereby, too, create new determinations upon parts where such irritation is relatively safe. This is an important idea to be kept before us, especially when the disease is seated in parts of great sensibility, either naturally so, or when acquired by disease, as in a pleurisy or an inflammation of the brain. Boyer, in cases of this nature, to our great surprise, trusts to the "laxatives," instead of active cathartics; the advantage of cathartics in this respect is very apparent. 4. Upon the same principle, we employ sudorifics, i. e. such of them as at the same time that they effect this evacuation, do it without adding to the general excitement of the system; on the contrary, which operate by relaxing the body, by unlocking the secretions, and, at the same time, retarding the circulation. Antimonial preparations, either in the

form of emetics, producing full vomiting, or in nauseating doses of that metal, are here indicated. Boyer objects to vomiting, yet he approves of venesection, because it relaxes; but, I ask, is not relaxation the principal effect we expect from antimonial medicines? Emetics are in many instances adviseable, particularly after other evacuations by venesection and cathartic medicines have been premised, as in cynanche trachealis, maligna and tonsillaris, but not in phrenitis, gastritis, or enteritis; of these hereafter. In the latter cases, antimonial preparations in nauseating doses are to be preferred, as James's powder, the antimonial solution, the union of tartarised antimony and the super tartrate of potash, (viz. $\mathfrak{z}\text{ij}$ cream of tartar, and tartar emetic gr.ij M., divide in pulv. viii. one every two hours.) Some prefer the combination of the antimonial powders with calomel, but if the latter be improper in inflammation, the combination certainly will not justify the use of it, except only as a cathartic. The sp. minder. with a small quantity of laudanum, is an excellent sudorific, or the citrate of potash, or the Dover's powder may be employed; opium, notwithstanding its supposed stimulant effect, you will find particularly proper after evacuations by the lancet, for the purpose of diminishing the pain and excitement attendant upon inflammation. Professor Reichter, of Gottingen, is a warm advocate of opium, for the purpose of subduing irritation in all inflammatory diseases; for even pain becomes an additional and aggravating source of excitement in such diseases. Ware, too, in ophthalmia, pursued the same practice. Dr. Post also, in his own person, frequently diverted inflammation from his lungs by the use of opium. 5. Blisters are also adviseable, by translating irritation from important parts, the seat of inflammation, and are useful by the new excitement they create upon the surface; with this view they are among the most valuable remedies to be employed. Sinapisms are also sometimes advantageously applied, upon the same principle. 6. Diuretics are in some cases prescribed with benefit, especially such as sensibly diminish the excitement of the system, as the nitrate of potash gr. x. or xv. every two or three hours, and perhaps digitalis, if this plant be ever safe or useful. But this poison, on account of its deleterious effects upon the brain, is to be administered with great caution; indeed, it may be dispensed with altogether, for you have abundant means of diminishing arterial action, without producing the deleterious and narcotic effects

which this medicine creates upon the brain, by which it effects the object of retarding the circulation; its sedative operation is doubted by Orfila, which induces me to doubt the correctness of his observations in general, not only upon this, but other subjects.

7. Local applications, which are calculated to lessen the activity of the circulation, are also to be permitted. In cases of violent local injury, in which a rupture of vessels takes place, and an effusion in the cellular membrane is the result, it is a good practice to empty the part by the lancet. I mean where the extravasation is very considerable, and more than the absorbents can readily take away. I know a case in which the blood was discharged with great benefit; whereas, when such blood is permitted to remain, it becomes coagulated, and afterwards undergoes a great change in its properties, and produces disease of the parts beneath, analogous to the retained menses behind the hymen. (See Smellie.) I have seen two cases in which an injury was sustained by persons rupturing a blood vessel on the anterior part of the leg, by striking it violently against the sharp edge of a carriage stone; they were neglected; the result was, the blood effused, acting as a foreign body created a good deal of disease and ulceration in the parts on which it lodged. I dilated them very freely with the bistoury, and dressed them as common ulcers. In another instance, where the tumor was very extensive, I introduced a seton, which had a similar effect in discharging the contents of the tumor, and in restoring the parts to a healthy state.

To prevent these consequences therefore, it is a good rule immediately to open such tumour and to discharge its contents as soon after the accident as possible, then applying a compress with lead water, a cure is readily effected. Upon the same principle the application of leeches, scarification, and cupping, are also to be used where a particular part is surcharged with blood in a less degree, especially accumulations about the brain, the eye, the mammæ, the testis. In the former, cupping is to be preferred, in the latter, leeches are the most effectual application. Lead water, that is, the solution of the acetate of lead, or Goulard's extract, is frequently had recourse to. In cases of recent inflammation it is certainly an excellent application, that is if applied at a moderate temperature; but applied as it usually is, cold, it is in many instances objectionable, by producing pain, especially in inflammation of secreting surfaces, or secreting organs, as the eyes, the

urethra, the joints, testicles. Cold water, vinegar and water, or salt and vinegar applied cold after recent injuries, I have ever observed to add to the distress of the patient under such circumstances, and especially in strains of the joints to which they are usually directed by most practitioners, they are peculiarly injurious; for they assuredly by their stimulant operation, add to the pain and to the stiffness of the parts to which they are so applied. Tepid applications, on the contrary, in the form of fomentations, are in my opinion, infinitely preferable, and are the remedies I usually direct; they soothe the parts and allay the existing irritation, and thereby diminish the flow of blood to the part affected, and are among the best means of effecting resolution of the existing inflammation. But when the inflammation is removed and the parts remain debilitated, in that case cold applications, cold water and other stimulants to restore the tone, are indicated; for cold water applied suddenly, as before remarked, is among the most powerful stimulants and restoratives to debilitated parts that we can direct. During the first stage of active inflammation, attention should also be paid to the diet of the patient, and which, as in synocha, should be very simple, and the least stimulating. Abstinence from animal food, from wine, and other stimuli, should be rigidly attended to; even in the quantity of bread and water, great moderation is to be observed—while lessening our fluids with one hand, let us not increase them with the other. Upon the same principle, too, we should enjoin the avoidance of all stimuli which are calculated to excite the system—as light, heat, noise, exercise of mind or body, should all be carefully guarded against.

But, secondly, when inflammation is very far advanced, and considerable obstruction or congestion has been produced, especially when seated in the yielding cellular and muscular fibre, the indication will be to promote effusion from the distended vessels; for it is now ascertained that the means already employed are insufficient, or perhaps we are called upon at that advanced degree of inflammation, that it is too late to expect benefit from their use. To promote such effusion or secretion of pus, from the congested vessels, we must have recourse to warmth and moisture combined, such as fomentations by means of flannels wrung out of vinegar and water, or an infusion of hops. The application of a warm poultice of bread and milk, or of ground flaxseed mixed with it,

or of the white lily roots, (the *lilium candidum*,) remarkable for their mucilaginous properties, and which, therefore, have probably been so long in use—or a poultice prepared of the slippery elm bark, (the *ulmus fulva*, called also *Americana*, by Dr. Dyckman, in his excellent Dispensatory,) or other American species—the seeds of the quince, (the *Pyrus cydonia*,) also make an excellent poultice—the pith of the *Laurus sassafras* also. Even to the inflamed eye, a poultice prepared of some of these emollient materials, is one of the best applications that can be made to the part—it should be boiled to a jelly. Tepid drinks, taken frequently, are also calculated to aid such effusion, and indeed in some cases if these means be early made use of, they prevent a purulent discharge, by removing inflammation and effecting resolution. But great care is to be taken not to reduce the tone of the system too much, or you prevent the secretion of pus, as you would impair the secretory power of any other vessels of the body; for both the whole system and the part itself, are sometimes so relaxed and debilitated that the parts remain stationary, neither tending to resolution nor proceeding to suppuration. In such cases both general and local stimuli so far from being injurious, are advantageously directed. In such cases of torpor or inactivity, bark, wine, and a better diet are to be prescribed. In like manner the stimulant gums, different stimulating plasters, stimulant poultices composed of onions, or garlic, honey, spirituous fomentations, and various other substances are had recourse to for the purpose of exciting the parts to suppuration; but be cautious that you do not employ them in active as well as in passive inflammation—this is a common error. Spirituous fomentations and the infusion of stimulant and bitter herbs are oftentimes improperly employed in the first as well as in the second stage of inflammation. When abscess is produced, that is, the effusion or secretion of matter has actually taken place, the matter is to be discharged without delay, by means of a lancet or the knife. Opening by caustic is too tedious, and leaves a ragged ulcer behind it, which by the use of the lancet or scalpel, is to be avoided. Such collection, too, should be discharged before a great excavation may have taken place; for the absorption arising from the stimulus of the foreign body, remember, is not confined to the parts nearest the surface, but as I have already told you, extends to every part of the parietes or walls of the tumour.

Again, it should be evacuated early, to prevent that debility, that laxity which follows long distension of such parts, and especially those which are naturally of a loose and relaxed texture, as about the anus. In like manner, when seated near parts of great importance, it should be discharged as early as possible, lest such parts become involved in the disease, as abscesses situated near the larger joints, as the shoulder, or hip, or knee joint. In like manner, such discharges, too, will both be facilitated by continuing the poultice perhaps a day, or even two; and which will at the same time lessen the irritation occasioned by the wound made to evacuate the matter. But of all things avoid the irritation of the part occasioned by the common practice of pressing it after opening, and indeed, as most strangely advised by Dr. Thomas. This becomes totally unnecessary when the part has been properly and freely opened. When the contents of the tumour are completely discharged, the next, the third indication will be to give tone to the debilitated parts, and to the whole system, where it also partakes of the debility that may now be produced. This is not only necessary for the purpose of preserving a healthy action, but to enable the parts to reproduce those materials which have been removed or destroyed, by the secretion or generation of new parts to supply such loss, and to fill the cavity created. For this purpose, tonics and stimulants are indicated, both general and local, bark, wine, porter, ale, milk punch, the most stimulant nourishments are the most effective means of building up the strength of the whole system, while stimulant washes, viz: soap and water with rum, or some other spirituous addition, or with the sulphate of lime, or stimulant ointments, aided by bandage or compress, are advantageously directed. Setons, too, to excite the surfaces of such collections as cannot be completely or safely laid open by the knife, may be employed. Stimulant injections may be substituted, and are among the means of exciting the parts themselves to healthy action. The principles upon which this treatment of the different stages of inflammation is founded, are no less applicable to phthisis pulmonalis and other inflammatory diseases, than they are to the simple phlegmon seated in other parts of the body. Even in the secondary stage of inflammation, constituting cancer, the same doctrine is our guide. Hence we now find extraordinary virtues ascribed to the carbonate of iron and other medicines, as if they contained a specific antidote to that disease. In this disease

be careful to avoid the relaxing effects of long continued poultices, as you would do in other ulcerations—you would otherwise render the part an issue—as I have known to happen in the N. Y. Hospital. I knew a case of a young mulatto woman that had a tumour of the breast for months—cured by the stimulant or alterative effects of mercury, at the same time that mercurial ointment and a mercurial plaster, by its stimulant effect on the breast, totally removed the obstruction of the part affected—the mode of treatment lately introduced by Samuel Young, by means of pressure, partly by plasters, and in part by compresses of sheet lead, no doubt is founded upon the same principle. (See Thomas' Pract. p. 609.) A fourth termination of inflammation, viz: by the serous effusion of fluids, as in the cavity of the joints, deserves our notice.

A dropsy of the part is produced by the large effusion which follows inflammation when seated in these secreting cavities. In this case we have oftentimes both increased exhalation and diminished absorption combined; a great determination to the part, and an inability in the absorbing and circulating vessels of the part to convey off the matter effused. Stimulating plasters, such as the composition heracleum gummiferum, the gum ammoniac, dissolved in the vinegar of squills, the stimulating ointment composed of tartarized antimony may be used. The same ingredients applied in the form of a wash; viz. $\mathfrak{z}\text{i}$. tart. antimony; $\mathfrak{z}\text{ss}$. sp. camphor; $\mathfrak{H}\text{i}$. water, are well calculated to produce an active excitement upon the surface, and thereby to divert the tumor from the part within, and perhaps to excite the absorbents of the joint to an increased action. This last application was first made use of in angina pectoris. (See Lond. Med. and Phil. Journal.) It is now employed in the treatment of white swellings, rheumatism, &c.

2d. The repeated application of blisters to the part, has been attended with no less beneficial effects. In the case of a lad, threatening white swelling, the tumor was removed by blisters, followed afterwards by the use of tonics, general and local. Another remarkable case also occurred of a respectable merchant of this city, who was relieved of similar dropsical affections of the joints, particularly of the knees and wrists, by the application of blisters. No less than twelve in succession were applied; but in that case he had been a cripple for three years. He now walks as uprightly as one of us. Another stimulating application which I have

prescribed with good effect, especially in those chronic enlargements of the joints, is the saturated solution of the muriate of ammonia in vinegar, as recommended by Benjamin Bell. In cases of inflammation, the ordinary gangrene, he particularly recommends this combination: his prescription is as follows:— \mathfrak{z} i. of the sal ammoniac; \mathfrak{z} ij. of vinegar; \mathfrak{z} vi. of water. The following is preferred by many: \mathfrak{z} ss. mur. ammo.; \mathfrak{H} i. vinegar or alcohol. But in the chronic cases I have referred to, the application should be stronger; viz. the saturated solution of the salt. But when the active inflammation is removed, i. e. all pain, heat, and tenderness to the touch, and mere enlargement and relaxation remain, great advantage may be obtained by the application of cold water, or the application of rum or brandy, and the parts sustained by the flannel bandage. The same division of the stages of inflammation and its consequences, with the different treatment indicated in each, is no less applicable in other inflammatory affections than in those of the joints, to which I have called your attention.

But, fifthly. In case of sphacelus, after inflammation has subsided, as occasionally occurs after blisters have been too long applied, what is to be our treatment?

1st. Remove the dead matter that may loosely cover the parts affected. This done, apply a stimulant poultice of bark and yeast, or bark and spirits, to the parts, and let them be applied moderately warm: occasionally also, cleanse and excite the surface of the part by washing it with a strong solution of soap and water, with the addition of yeast or spirits; or make use of the sulphate of zinc or of copper; or apply the acetate of copper, in the form of an ointment, to the blisters when sphacelated. In like manner, it is useful to burns, assuming that character. From gr. ij. to gr. iv. to \mathfrak{z} i. of simple ointment. In the Infirmary of Edinburgh, the rectified sp. of wine is generally made use of as the most useful application to mortified parts, and is preferred to the bark, as a local application. Dr. Kuhn made an experiment in the Pennsylvania Hospital, upon a person, both of whose legs were mortified: to one he applied the spirits of wine, the other he covered with the powdered bark. The first was the best application. In a short time, if the system be supported by proper nourishments, and by the use of bark, bitters, and other tonics, a healthy secretion will soon take place, and throw off the sphacelated parts. The carbon poultice, viz. \mathfrak{z} ij. of charcoal, finely pulverized, and mixed with the common poultice, is also useful for correcting the

fœter, and changing the character of such ulcer. The carrot poultice is made use of for the same purpose. The fermenting poultice is also an useful and active application; i. e. a poultice composed of meal, either Indian or oatmeal, or other meal, with a proportion of ground flaxseed meal, mixed with the infusion of malt, with the addition of fresh yeast to it, at the time of the application. Fermentation soon follows. This application, by its heat and moisture, and stimulant materials composing it, is among the most effectual means of preserving the tone of the parts, of exciting a healthy action, and thereby of separating the dead matter usually attendant upon sphacelated parts. When such separation may be effected, afterwards, as before directed, support the tone of the parts by bandages and other local stimulants. But if inflammation still continues to accompany this appearance of gangrene or sphacelus, the simple poultice should be renewed until such inflammation shall have subsided, and the line of separation between the living and dead parts become apparent. The gastric liquor of graminivorous animals has also been used by Dr. Harness with success, in arresting mortification, in separating the diseased parts, and in promoting healthy granulations. (See 2d vol. of the Trans. of the Society for promoting Med. and Chir. Knowledge.) Dr. White, of Manchester, has recommended, in cases of this sort, the use of musk and ammonia, to remove the irritation, the subsultus tendinum, and other distressing symptoms, frequently attendant on the local organs and producing high inflammation and sphacelus, as the effect of punctures. His prescription consists of musk and ammonia, gr. x., each in bolus. Another means recommended by a late writer in the Med. and Phys. Journal, for the purpose of arresting mortification, is by sprinkling the parts twice a-day with the nitrate of potash, finely pulverised. Mr. Pott has also written a paper in praise of opium in mortification, especially that which attacks the toes; i. e. that opium is useful in arresting the irritation and pain which continue the inflammation when seated in parts of so much sensibility as the toes, and which irritation probably continues the inflammation until it ends in the total destruction of those parts. In cases of this sort it is doubtless indicated for the purpose of removing the sufferings of the patient, at the same time that it exerts its salutary effects by the general relaxation and diminished circulation that ensue from its use. But it is certainly a good general rule, that opium is not to be employed until the force of the

circulation has been subdued by venesection, and other depleting means, and only where the inflammation is seated in parts of great sensibility, and thence producing an inordinate degree of pain. Hence you do not find Mr. Pott's prescriptions of opium made use of in other cases of inflammation and sphacelus, but when thus seated in highly organized parts. In violent inflammation of the eyes it has also been found serviceable.—Case of Mr. Hartshorn, subject to ophthalmia, in which he informs me he has arrested the disease in its forming state by taking a large dose of opium and camphor: op. gr. vi., camph. gr. iv. There is another form of mortification, denominated dry mortification, arising from the ossification and obstruction of the arteries of the toes, in which opium is of little use, and which is only to be removed by early amputation. In such cases, Dr. Mott states he has sometimes found this practice useful. Dupuytren, on the contrary, is opposed to amputation, under such condition of the system, believing that the whole system labours under some general affection that produces such obstruction of the arteries. A very questionable practice has been recommended by the late Dr. Peiffer, and adopted by Dr. Physic; that of blistering mortified parts. This practice has more the air of novelty than real usefulness to recommend it. They can certainly be of no other use than as stimuli to the parts, or to the whole system. But these effects we derive from the antiseptic and tonic applications of yeast, bark, spirits, and the fermenting poultice; and we may add, the pyroligneous acid. May not the pyroligneous acid be advantageously employed as an external wash in typhoid fevers, as well as the acetous acid? Whereas, you have not only the stimulant operation of the cantharides, but a new inflammation, which, like the first, may add to, instead of diminishing the evil. For the same reason that scarifications, in such cases, have been laid aside because of the fresh inflammation they create, I should question the propriety of applying blisters. Dupuytren uses the actual cautery to excite the surface of sphacelating parts. Astley Cooper employs the wash of the nitrous acid and water, ʒi. to a quart. But the most formidable state of gangrene and sphacelus in the form of carbuncle, and that, too, under the most unfavourable circumstances, yield to the treatment I have recommended, and as such I shall continue to employ it; together with the free use of bark, wine, and other stimulants and tonics, while the debility of the whole system, or of the part, may continue.

LECTURE XXXV.

PHLOGOSIS.

PHLOGOSIS, Dr. Cullen defines to be *pyrenia, partis externæ rubor, calor et tensio dolens*. This genus he divides into two species: 1. Phlegmone; 2. Erythema, in which he includes the erysipelas of authors. But Dr. Cullen is not satisfied with this arrangement; he not only includes erysipelas here as a species of phlogosis, but in his order of exanthemata he again makes erysipelas a genus, besides including it under the species of phlogosis, viz: erythema. Rather let us make them, as they should be, three distinct species of phlogosis: 1. phlegmone, 2. erysipelas, 3. anthrax. 1st. Phlegmone, which Dr. Cullen defines thus: *rubore vivo; tumore circumscripto; in fastigium plerumque elevato, sæpe in apostema abeunte; dolore sæpe pulsatili*. Yet he strangely believes all distinctions of inflammation founded on the structure of the parts, the seat of inflammation, to be altogether visionary; absolute folly; inepta! 2d species, erythema, the erysipelas of authors, he thus defines: *phlogosis, colore rubicundo, pressione evanescente, ambitu inæquali serpente, tumore vix evidente, in cuticulæ squamulas, in phlyctænas vel vesiculas abeunte; dolore urente*. Here, again, according to Dr. Cullen, such distinctions are visionary. A man must indeed have a singular abhorrence to correct reasoning that can thus violate his own principles in almost every page. Under this head of erysipelas, or erythema, he includes anthrax or carbuncle, as the more violent form of erysipelas, the erythema gangrenosum of Sauvages. But there are so many peculiarities, as we shall see, in the carbuncle or anthrax, that I am inclined to separate it both from the phlegmone and erysipelas; more especially

too, as requiring a particular and distinct treatment, and different in some degree from either. Phlegmone we shall find to be seated more immediately in the cellular membrane; erysipelas in the skin, rarely extending to the cellular substance; but anthrax includes both as its seat, at the same time that it most usually involves even the fasciæ of particular parts of the body, as those on the back of the neck, on the loins, and on some parts of the extremities. So far, then, they differ in their seat: but erysipelas we shall find to extend over the whole or any part of the body, but affecting the skin alone, while anthrax is local; though in its course, and in the fever which attends it, it involves the whole system, yet it has, where it terminates favourably, the suppuration of phlegmone, but like erysipelas it has great tendency to sphacelus. Hence it may be considered as a compound both of phlegmone and erysipelas, but having characters sufficiently peculiar to constitute it a distinct species. Dr. Cullen notices, but very unnecessarily, the various terminations of phlogosis, or local inflammation, under different heads; viz. 1. Suppuration or apostema, (read these in his Nosology,) “post phlogosin, remittentibus dolore et pulsatione, tumor albescens, mollis, fluctuens, pruriens.” 2. Gangrene, the part livid, soft, little sensibility, and vesicles pouring out ichor; “post phlogosin, pars livens, mollis, parum sensibilis, sæpe cum vesiculis ichorosis.” 3. Sphacelus, the part black, flaccid, easily torn, with loss of sense or heat, and with the fœtor of putrid flesh, the corruption or destruction spreading rapidly; “pars nigricans, flaccida, facile lacerabilis, sine sensu vel calore, et cum fœtore carnis putridæ, vitio celeriter serpente.” These two last are mere grades of death in the part, and the whole of these terminations are but the symptoms of phlogosis, and should make a part of its history, but do not call for the distinct notices bestowed upon them separately in Dr. Cullen’s Nosology.

Phlegmon, the first of these species, falls first under our attention. This species of phlogosis, as I remarked, is seated in the cellular membrane, and exhibits a train of symptoms similar to those already noticed when speaking of inflammation in general. Phlegmon we may define to be a tumor, circumscribed, painful, red, and elevated, for the most part, to a point or top, terminating sometimes in resolution, most frequently in suppuration, and occasionally in sphacelus; depending upon the seat of it, and the nature of the cause producing it. Its causes have also been em-

braced in our view of inflammation in general. Our indication in phlegmon is, in the first or forming stage, to effect the resolution of it, if possible, and especially if it be seated in very important parts; this is to be attempted by the means already pointed out, viz: 1. by evacuations, venesection, leeches, cathartics, antimonials; 2. by blisters; 3. local sedatives, as the lead water poultice, lead water and laudanum, (excepting when such inflammation is seated in secreting surfaces.) In all cases these applications should be employed of a moderate degree of warmth, not cold, as recommended by Thomas, and indeed by most writers. Fomentations of vinegar and water are also among the best applications for effecting the dispersion of such tumors, especially in the mammæ and testis. But, secondly, if the tumor be so far advanced as to give you no reason to expect its dispersion, you are next to promote the formation of matter in the manner already pointed out, and to discharge it as soon as possible by the lancet or scalpel. Do not leave it to discharge itself, for, as already remarked, you will have a tedious ulcer, and one in some cases attended with great inconvenience, as in the inflamed breast, and in other cases attended with real danger, as when seated near an important joint. Should the tumor be large, and so seated that you are in danger of dividing important vessels, nerves or tendons, if by pressure or stimulant compresses you cannot excite the parts to healthy action, and destroy the fistulous state of the parts within, or stimulant injections fail, make use of the seton; this not only effects a complete discharge, but it also stimulates the diseased surface, and thereby promotes the healing process. The matter being thus freely discharged, the second stage having arrived, in which all inflammation is removed, the next object is to restore the tone of the part, and of the whole system; not only for the purpose of filling up the cavity created, by the generation of new flesh, but so to invigorate the whole system as to diminish that sensibility to fever, which is, otherwise, at the time likely to ensue, from the absorption of pus. I mean hectic fever, and which I contend never arises from any other source, but that analogous to fevers from irritation, the effects of acrid matter in the blood vessels, as in the typhus, scarlatina, and various other eruptive diseases, so this is caused by and continued by the presence of pus, whether the produce of an ulcer or the soft parts of the core. Hence Dr. Cullen considered it as always symptomatic, and did not give it a

place under fevers properly so called. We find the matter of the different contagious diseases to produce fevers of a peculiar character: so purulent matter begets its peculiarities, producing generally two paroxysms in the twenty-four hours, about mid-day and midnight; and accordingly you perceive that when such matter is freely discharged, hectic fever is readily removed. But even where absorption of pus takes place, fever is frequently prevented or diminished by the use of tonics and stimulants, viz: bark, elix. vit., bitters, &c., and sometimes by opiates, as Dover's powders, with a nutritious diet, such as animal food, the liberal use of porter, ale, wine, &c. These remedies I remark are frequently too long neglected, not only to the waste of the whole system, but that in some instances the sphacelus of the part is also the consequence of the general debility induced. Hence, therefore, when matter has been formed and discharged, we cannot too industriously make use of both local and general stimulants and tonics, to bring about the healing process in the part as well as to improve the state of the whole habit; both the local and general means of accomplishing these objects have already been particularly enumerated. In case of gangrene or sphacelus occurring, as we know by the blister appearing on the part, the remedies have also already been noticed, viz: bark, wine, the yeast poultice, the fermenting poultice, the infusion of malt with yeast and oatmeal, or strong beer mixed up with these last materials.

The second species of the genus phlogosis, in the arrangement we have adopted, is erysipelas. The word comes from *ερωω*, to draw, and *πelas*, adjoining, because it involves the neighbouring parts. Dr. Cullen places this disease among his exanthemata; but he also notices the same when entirely local, and confined to the skin, without an affection of the whole system, under the head of erythema, making it a species of phlogosis, while that more formidable shape of the same disease, in which the whole system is affected, he places among his exanthemata or eruptive diseases. This distinction is certainly not well founded; and indeed you will find, under his erythema, the most malignant form of erysipelas described by authors; nay, under the head of the milder erythema he also includes among his synonyms the still more malignant affection, both of the skin and of the whole system, called carbuncle or anthrax. This, surely, is inconsistent with correct arrangement. Although I have retained the arrangement of

eruptive diseases as adopted by Dr. Willan, and you find erysipelas among them, that I might not violate the integrity of his order, certainly the most proper place for erysipelas, which is not to be considered an eruptive disease, but is rather a pure inflammatory disease of the skin, is among the phlegmasiæ. I have accordingly made it, as you will recollect, the second species of phlogosis, for the purpose of distinguishing it from its fellow members of the same family, phlegmone and anthrax. The first of which is seated in the cellular membrane—the last in the skin and cellular membrane combined, while erysipelas chiefly confines itself to the skin alone; and they all occasionally, however, like other inflammatory diseases, transgress their several limits; that is, phlegmon runs into erysipelas, and erysipelas into anthrax. But when erysipelas extends beyond its ordinary limits into the cellular and adipose membrane, in that case the inflammation beneath is the effect—the effect too, of bad management. But it is not an essential part of the disease; on the contrary, so far it is a departure from the original character of the complaint, and which erysipelas derives from the peculiar organization of the skin, viz: its dense texture beset with small sebaceous glands and exhalents, which appear in a peculiar manner to be the seat of the disease. Dr. Cullen defines erysipelas to be an inflammatory fever of two or three days; in general with drowsiness, often with delirium, affecting some part of the skin with an inflammatory erythema, but most frequently the face. *Synocha duorum vel trium dierum, plerumque cum somnolentia, sæpe cum delirio, in aliqua cutis parte, sæpius in facie, phlogosis erythema.* Observe, in shingles oftentimes there is little or no fever, and very rarely, if ever, delirium. He divides it only into two species, the *vesiculosum*, ending in large blisters, including *rosa*, that is, erysipelas of the extremities, and *sideratio*, as it appears on the head and face; and the second species, *phlyctænodes*, which consists not of large, but many small pimples or spots, and which end also in small blisters or vesicles, and are for the most part confined to the trunk of the body. Under this species he describes the shingles, being a corruption of the French term, *ceinture*, a belt or girdle, or *zona ignea* of Hoffman and others—so called because it surrounds the waist like a belt; the eruption in some instances reaching entirely round the body. But Dr. Cullen has great doubts whether this species, the *phlyctænodes*, is at all different from

the first, the vesiculosum. Dr. Cullen also suggests the possibility of there being an inflammatory and a putrid erysipelas; but that of this he is not satisfied to say whether these two species should be formed; he very justly observes that as in hot climates the putrid diathesis exists, and in the cooler climates that the inflammatory diathesis prevails; so in like manner the same disease may accordingly have different tendencies to the one or the other depending on these circumstances. There is doubtless some foundation for this distinction as far as a septic tendency will aggravate the symptoms of erysipelas. Accordingly it happens that in an impure atmosphere, as on board of ships crowded with men, and in hospitals, there is not only a great tendency to erysipelalous inflammation from the slightest wound, but erysipelas also readily assumes the typhoid character; and hence, too, it has been said to be occasionally in hot climates, a contagious disease. Thomas, in St. George's Hospital, Dr. Parr, also see Good, vol. ii. p. 646—7. Willan, Dr. Wells, Pitcairne, Baillie. In the Guerriere it has been observed, in her late voyage to the Mediterranean, that notwithstanding the free use of fruits and vegetables, such was the habit of body induced, that in every person on board who received the slightest wound or fever, it assumed immediately a malignant character. But from the very texture of the skin itself, even in temperate or cold latitudes, there is a great tendency to sphacelus and the typhus type of its fever; and Dr. Cullen very properly, himself, remarks in the same note, that erysipelas oftentimes carries with it somewhat of a gangrenous nature, (*"hic tamen notandum est erysipelas sæpe aliquid putridæ et gangrenosæ indolis cum se ferre."*) I divide this disease into four varieties.

1st. Sideratio as it appears upon the head and face, and which is the most troublesome, the most tedious, and the most dangerous; for in this eruptive disease, as we see in small pox, not only the eruption is greatest about the head, but such is the determination to the head, that not only all the external parts become highly loaded with blood, and all the features swelled or distorted, but the brain itself becomes severely affected, either by stupor or delirium; and sometimes hydrocephalus is produced, for the carotids cannot carry an inordinate quantity of blood to the scalp, without also conveying a disproportionate quantity to the brain, being both branches of the same trunk. An important in-

ference from this is, that in affections of the brain, as phrenitis, hydrocephalus, apoplexy, our blisters will be more properly applied to the distant parts of the body, or between the shoulders, than to the head itself.

2d. Zona, or belt, or shingles, which appears upon the trunk of the body, and chiefly about the waist, and like herpes, gradually multiplies itself to such an extent as to reach entirely around the body, which among the vulgar it is supposed to be attended with great danger. According to Dr. Darwin, this form of the disease frequently denotes an obstruction in the liver or some other of the viscera—this is not always true—for it frequently arises from a check of the perspiration alone; hence, it is common in the autumn, especially in plethoric habits.

3d. Rosa—the erysipelas of the extremities, and which we most usually see, as connected with the gouty diathesis and old age.

A fourth variety is the symptomatic, that is, attendant upon other diseases, as fevers, as miliary and typhus fever. It is frequently symptomatic, too, of affections of the stomach and bowels from indigestion, symptomatic of teething, and of obstructed perspiration, especially in the heat of summer, or after violent exercise. This form shows itself in different parts of the body, and frequently in patches or weals. These also appear suddenly, and are as suddenly removed; whereas the varieties before mentioned, are of longer duration. The symptoms of erysipelas or St. Anthony's fire, more especially as it appears in the more formidable shape of sideratio, are :

1st. The symptoms of inflammatory fever, viz: chills, succeeded by general excitement of the system, a quick, hard pulse, hurried respiration, tongue white, much thirst, the skin unusually red, and attended with a sense of itching and sometimes burning; the surface, too, is remarkably dry as well as hot, and perspiration is not easily induced, resembling in this particular, the locked state of the excretory vessels that we meet with in scarlet fever. The whole system being powerfully excited, in a short time an elevation of the parts of the surface most affected is perceived, and an increased secretion from that part of a thin sharp acrid humour is now very apparent; fresh inflammation is excited as well as an increase of the first; small vesicles are produced, and in some cases a considerable discharge of a thin watery humour is manifest to the eye; but in some instances this is not

perceptible, except by means of glasses; yet an irregularly spreading inflammation takes place wherever the fluid extends, and probably beyond. It is however true that if wet or greasy applications be made use of, the inflammation is still more extensively diffused. A fatal angina in some cases ensues, when seated upon the neck and throat; or if in the head, such is the great flow to the brain that all the features become swelled and disfigured; the eyes in some instances are closed; but the irritation is not only external, the brain becomes oppressed by stupor; in some cases absolute phrenitis is induced. The disease thus continues for eight, ten, twelve, or fourteen days; if it is not gradually removed by evacuation, and resolution effected, it terminates either in vesications, foul ulcers, or gangrene, or it breaks down the system by effusion upon the brain, or ends in typhus, and thus proves fatal. Hence it has been observed that inflammation of the brain and its consequences have been found upon dissection after death in this disease. This inflammation never ends in suppuration, or it ceases to be erysipelas. Suppuration, says Pearson,* is never seen in genuine erysipelas; but it has a constant tendency to gangrene and sphacelus. Erysipelas, as I remarked before, derives its peculiar character from the very highly organised and dense texture of the skin, and of the infinitely numerous glands with which it is supplied independent of its excretory vessels, the functions of all of which are probably diseased in erysipelas. In consequence then of its great sensibility, and its numerous nerves, we are not surprised at the tendency of this disease to gangrene. But suppuration sometimes attends it when it involves the parts beneath, as in anthrax. I have seen a case of cedematous effusion in the cellular membrane beneath, enlarging the neck and distending every feature of the face. The predisposing causes of erysipelas, are:

1st. Certain temperaments, and especially the sanguineous and the nervous. Females are more liable than males; and children than adults, owing partly to their greater sensibility of habit. Hence, too, it appears more in certain families. Capt. G—d's family, of the sanguine temperament, are subject to it, father, son, and daughters, and most usually every autumn. The same sensibility too, that is occasioned by one attack, predisposes to a second, &c.

* Principles of Surgery.

2d. A plethoric state of body predisposes to erysipelas; hence it frequently attends upon pregnancy—hence, too, it follows a sudden suppression of the menses, or is the consequence of their natural cessation. Women giving suck whose menses are suppressed, are frequently the subjects of erysipelas, especially upon being heated by exercise.

3d. A vitiated state of the fluids, this was the opinion of Hippocrates and Galen. Tissot, too, ascribes erysipelas to the state of the blood, and to the want of due discharges by perspiration, in like manner it is frequently the attendant on chronic rheumatism. And it is the effect of old age, in which case both the plethora of age and the vitiation from the diminished excretions usual in advanced life, are probably combined. The exciting causes of erysipelas are,

1st. Cold, suddenly applied, especially when the body has been previously heated; a cold bath made use of when the body is in a state of perspiration, is a frequent exciting cause of this disease. Hence, too, erysipelas is the disease of autumn.

2d. The suppression of the natural excretions by the skin, bowels, or the menses, from whatever cause such suppression may proceed, is another common cause of erysipelas.

3d. Fever is another exciting cause of this disease; not only by means of the stricture upon the excretions which takes place in fevers, but also by the inordinate excitement of the blood vessels, such determination to the surface is both produced and aggravated.

4th. The irritation attendant upon indigestion frequently excites an erysipelatous inflammation on the surface. Lobsters, crabs, and other articles difficult of digestion, are fruitful sources of that disease. The effects of vinegar show the intimate connexion between the state of the stomach and the surface of the body. From the connexion between this disease and the disturbance of the digestive organs, some writers, ancient and modern, have considered this disease in some cases to be of a bilious nature, and have made a species of it, which they so denominated. Galen, among the ancients; Desault, Richter, and Richerand, among the moderns. They therefore attach much value to emetics. (See Cooper's Surgery.)

5th. The irritation of teething produces not only sore ears, or a strophulous on the cheek, but in some instances a general eruption and erysipelas, with a febrile state of the whole system, are the consequence.

6th. Irritation of the skin itself, as by blisters, wounds, &c. is a frequent exciting cause. Blisters I have known to excite an erysipelas, which diffused itself over the whole chest.

Sulphur, mercury, arsenic, the euphorbium, the fumes of the cashew nut, (*anacardium occidentale*.) Insects may also be included among the exciting causes of erysipelas.

7th. Wounds, as gun-shot wounds; wounds, especially on the head, and scarifications employed in dropsy of the extremities, and especially the large incisions made by the lancet instead of slight punctures.

8th. The distension of parts, as in dropsy, is sometimes followed by erysipelas, in the form of *rosa*; i. e. in the extremities; and that, too, not unfrequently ends in *sphacelus*, and proves fatal.

9th. Heat, as the direct rays of the sun, not only in the tropics, but even in our temperate climate. Burns, and scalds.

10th. Intemperance in the use of spirituous liquors.

The phenomena which we have noticed to characterise this disease; viz. the white tongue, the frequent and tense pulse, the hot and dry skin, and great thirst, all announce it to be, especially in the first stage, a pure inflammatory disease. The causes, too, both predisposing and exciting, lead to the same conclusion; and that it demands the treatment which we have observed is indicated in such condition of the system: guided, however, by the habit of body, the peculiar cause from whence it has proceeded, the part more immediately the seat of the disease, time of life, duration of the disease. Venesection is called for where the disease occurs in a full, athletic habit of body, and has been occasioned by cold, or suppression of the natural evacuations, as of the menses, or in pregnancy. Venesection then is to be employed liberally, especially when the disease appears upon the head and chest. In like manner, the species called *zona*, when induced by change of season, is most effectually removed by the same remedy, inasmuch as it usually occurs in the full habit of body. To my great surprise, I perceive Dr. Good is not the friend of venesection in this disease. He remarks: "Venesection was formerly recommended, and has been so, of late, by a few writers, but upon mistaken principles." "I can conceive," he adds, "very few cases in which it has a chance of being serviceable." He then recommends gentle laxatives, and instantly after tonics, bark, &c.

2d. Cathartics are, for the same reason, to be employed, as the saline cathartics. Dr. Friend appears to depend principally upon cathartics, even in the most violent forms of this disease. In a gouty habit of body, where the stomach is generally irritable, the preparation of rhubarb, magnesia, and mint-water may be preferable. In the erysipelas occasioned by teething cathartics are also indicated, especially magnesia. This, on account of the acidity which is predominant in the stomachs of children, at this period of life, is peculiarly advisable. I am also, on account of the febrile symptoms, much in the habit of directing the combination of small doses of ipecac. and rhubarb, aa. gr. i.; or gr. ij. M.: these are my favourite febrifuge, which I denominate my tooth-powders, or rather my teething powders.

3d. In some cases of erysipelas, as that from the sudden check of perspiration, or from indigestible food, emetics are the most effectual means of removing the disease, and will be found useful in this disease in most cases, except where it arises from plethora or in a gouty habit of body. But remember, where a fulness of the vessels exists, and perhaps a determination to the brain, that emetics, by the mechanical effects of vomiting, in retarding the return of blood from the brain, are in such cases peculiarly dangerous. In old age they should on these accounts be avoided.

4th. Antimonial and other diaphoretics are generally indicated in this disease; but,

5th. What shall we apply to the parts affected?

The best applications, in my opinion, are such as will not only defend the parts from the air, but which at the same time are calculated to absorb the acrid, watery fluid which is poured out from the inflamed glands and excretories of the skin, and thereby to prevent the disease from extending. Any moist application or ointment, I observed, is calculated to spread the inflammation; therefore let all such be carefully avoided. Chalk, starch, very fine wheat flour, or rye or oat meal, and hair powder, dried over the fire, are in my opinion the safest and the best applications for this purpose, and should be frequently renewed by means of a puff, removing at each application of the farina, such portions as may have been rendered wet by the discharge, which, in some cases, is very profuse. In this way powder the parts fifty times a day; a very good powder is half starch, half calamine. (See Good vol. ii. p. 616.) Blisters have lately been recommended by Dr.

Dorsey and Physic, upon the authority of the late Dr. Pfeiffer, of Philadelphia, who is said to have introduced that practice; and which, both Physic and Dorsey advocate as the best mode of healing erysipelas. Dupuytren applies them in the erratic erysipelas; also the actual cautery! Delpech also states that he has frequently prevented suppuration or sphacelus by the early application of blisters. Where the brain is much affected by stupor or delirium, they will no doubt be found useful. Where sphacelus is approaching they may also be found beneficial; but I have never employed them. In some cases the farinaceous applications are said to be of but little benefit. In these cases, Dr. Thomas states that cooling lotions, as recommended by Cooper, (see his Dictionary of Surgery, and his First lines,) he has found of great benefit; and that, for this purpose, he has made use of the liquor ammoniæ acetatis and water, equal parts; or muriated ammonia dissolved in water, with the addition of a little vinegar and camphorated spirit, with great relief to the feelings of the patient, when the farinaceous powders seemed rather to aggravate than soothe the sufferings attendant on this complaint. But where this is the case, I am fearful the vis a tergo has not been taken off by the lancet and other means of depletion. But perhaps by the severity of the disease, or by the neglect of the depleting means recommended, you are called upon to prescribe for the parts already arrived at the state of gangrene or sphacelus. Farina now will be of little use; in such case, treat them by the same means which we have already recommended in sphacelus and gangrene from other causes, viz: by the yeast poultice, bark and yeast, bark and spirits, and the liberal use of bark internally. If the patient be young, he may still perhaps be preserved, but if in the decline of life, you have little to expect. Dr. Fordyce gave it in doses of ʒi. every hour; he tried it for twenty years, and with growing confidence, says Dr. Good; but he adds, "when there is an evening exacerbation, some diaphoretic, as James's powder, is called for, or the sp. mind. with the spirit of sulph. æther; or which is in my opinion preferable, the nitrous æther. Where the habit is much vitiated, as is frequently the case in old age, and in persons who have suffered much from chronic complaints, as gout or rheumatism, you will find great benefit in the ordinary erysipelatous eruptions of such habits by the use of the decoction of the woods, composed of guaiac and sarsaparilla, i. e. after the use of

some mild aperient. Lead water has been recommended, by Dr. Dorsey and others, as an external application which has been employed with benefit in this disease. Dr. Thomas, in my opinion, very justly remarks that no solution of lead, copper, or alum, should be employed in erysipelas; but if it be of service in removing the inflammation of erysipelas, it can only be so after the various means of depletion which have been enumerated have been previously employed; it will otherwise be a hazardous prescription; for even if we succeed in repelling such inflammation without previous evacuations, and the first cause of the disease be still operating upon the system, we only translate irritation from one part of the system to another, and perhaps to the brain, or some other organ intimately connected with life; apoplexy or convulsions are, I believe, frequently thus produced. If eruptions or local irritation ever prove critical in fevers, so may the repelling of such eruption be the means of renewing fever, or of exciting some other irritation in the system; hence, then, the danger of suddenly suppressing local irritations, when they appear; and especially when they may have been of some duration, and the system has become habituated to them. Two or three facts on this subject will at least teach us caution in the use of this remedy. In a case of an eruption behind the ears, from teething, I overlooked the cause; directed some mild aperient and lead water to the eruption; the inflammation was suddenly suppressed, fever was renewed with convulsions, which terminated in death. An habitual ulcer and irritation in the forehead, operating like an issue to the system, was removed in the same manner; but apoplexy soon ensued, and proved fatal. But in a case of erysipelas on the arm and chest, in an old gentleman, of this city, of full habit, where venesection was omitted, and wet applications of this nature were employed in the first stage, instead of the farinaceous wheat or rye; sphacelus ensued and proved fatal. Look at erysipelas, therefore, as a disease of the whole system, and remember the great tendency to sphacelus, which inflammation manifests when seated in parts too highly organised. Nevertheless, there are cases in which, after the excitement of the system has been removed, the local irritation of the skin will continue; in that case, lead water has in some cases been very advantageously directed. Magnesia, too, used in the place of lead water, is beneficially ap-

plied without a translation of the inflammation. The diet and regimen of the patient should also constitute a part of your prescription, and should be directed according to the stage of the disease. In the first stage it should be simple and plain, and chiefly composed of vegetable nourishments and acid fruits; the frequent use of diluents, to promote the secretions, should also be enjoined, especially the sub-acid drinks, as tamarind water, lemonade, currant jelly and water, barley water, &c. But in the second stage, especially where gangrene is to be apprehended, the diet of the patient should be stimulant and cordial, with the liberal use of wine and porter, sago, arrow root, &c. The dress of the patient, air of the room, temperature of his drinks, should also be attended to as in the treatment of inflammation in general. But should the typhoid termination of the disease, the erysipelas gangrenosum of Willan, show itself instead of the inflammatory character with which it usually appears in this climate, you will, in that case, have recourse to the means we have so fully recommended, viz: bark, snakeroot, the mineral acids, and especially vegetable nourishments and the plentiful use of wine. There is another form of erysipelas noticed by authors, I mean the erysipelas infantum of new born infants. (See Underwood.) One form Bromfield has described; another form of it, as attended with variations, and tending to gangrene. In it the external use of bark and spirituous fomentations are the chief remedies. Lead water was found by Dr. Garthshore injurious, by inducing sphacelus. Blisters also are injurious. (See Willan. See Thomas and Underwood.) But the spirituous applications have been more successful: both have been tried in the British Lying-in Hospital. Bark also has been given by injections. A third form called by Drs. Hamilton and Underwood, skin-bound, and by the French "endurcissement du chair," is also occasionally met with, but I believe never cured.

LECTURE XXXVI.

ANTHRAX, OR CARBUNCLE—THE THIRD SPECIES OF PHLOGOSIS.

ANTHRAX is a Greek word signifying a burning coal. Carbuncle comes from carbo, charbon the French call it. This disease, as I remarked before, when dividing the genus phlogosis into its three species, appears to partake both of phlegmon and of erysipelas in many of its symptoms; it divides itself into two species. 1st. Idiopathic anthrax, and 2d. symptomatic anthrax. It is symptomatic when it occurs in plague, in typhus, in yellow fever, or in other diseases. This subject has very early attracted the attention of physicians. Galen, in his work, *De tumoribus*, Celsus and Fabricius have all shown their knowledge of this malignant form of inflammation, and by modern writers it has also been very minutely described; particularly by Wiseman, Bromfield, Kirkland, David, in the *Academy of Surgery*, by Pouteau, Pearson, William Fordyce, and by Willan and John Hunter. In the *Medical Comm.*, vol. ii. pp. 34, 37, you will also find that it has received notice. But notwithstanding the attention that has been bestowed upon it, both by the ancients and moderns, there appears to be a great diversity of opinion relative to the mode of treatment which ought to be pursued in this disease. Having seen several cases of this tumor, some of which have ended fatally, and others have been treated with success, I shall now submit to you such observations as I have been enabled to make on this interesting subject.

Anthrax I define a hard circumscribed tumor, seated both in the skin and cellular membrane, accompanied with a sense of burning and pain, (not the pulsation of ordinary phlegmon, nor is it confined to the skin as erysipelas,) of a livid purple hue, and early exhibiting the symptoms of approaching sphacelus, for such is its

general tendency unless relieved by art. 1. It begins like a common boil, having the circumscribed character of phlegmon; in the beginning too it has redness, great pain, with burning heat, but not the pulsation of phlegmon; sometimes a violent itching exists in the part. 2. In a day or two, for the inflammatory or active stage is comparatively of short duration, the tumor manifests a dark crimson red colour, particularly in the centre, but paler towards the circumference. 3. It soon shows a small pimple or pustule on the top, and at first view you may be inclined to think that the tumor is about to discharge itself at this point, and thus terminate. Not so: for the top being broken off, it is not well formed pus that is discharged, as in simple phlegmon, but a sharp, thin, brown liquor, a sort of bloody water, or sanies, and that without the least relief of its symptoms. 4. The swelling does not become very much elevated above the surface, but remains for a long time, say several days, hard and deep seated, attended with great stiffness in the neighbouring parts, and severe pain, especially on motion, and exquisite sensibility to the touch. Like erysipelas, too, it has the burning heat of skin; shows the skin to be much affected, and that too very early; manifesting throughout a dark reddish brown, or even a crimson, or a purple colour, and attended with great sensibility; like erysipelas too it exhibits a diseased and febrile condition of the whole system; like erysipelas it is not inclined to end in pus as its natural termination, as is the case with phlegmon; like erysipelas too it is protracted beyond the usual period of phlegmon, and much inclined to gangrene; and like gangrenous erysipelas, says Dr. Willan, (p. 497,) the swelling exhibits a dark red inclining to a livid hue. It shows, as I remarked, a febrile state of the whole system, and this fever, I should add, has a great tendency to the character of typhus. The pulse, very early in the disease, is weak and low, but frequent; for the operation of the disease upon the system is severe, and the subjects of its attack are usually the aged and the feeble, and whose general health is more or less impaired by previous disease, particularly eruptive diseases. An exception is mentioned by Tournefort, who states, in his *Travels through the Levant*, that it attacks feeble infants in warm climates, and proves quickly fatal; he also describes it as endemic, in his day, among the islands of the Archipelago. The tongue is sometimes white, but frequently it is moist, and in some cases of a deep red colour,

as in the advanced state of typhus fever; the patient is usually languid, showing great prostration of strength, and that, too, appears early in the disease; and such is the depression of the vital powers, that it is frequently difficult to excite the system, even by wine and cordials; such, too, is the impression made upon the nervous system by this disease, that the patient very early manifests it; sometimes it shows itself in great restlessness; a general irritation and sense of itching over the whole surface of the body, and eruptions too are commonly attendants upon this excitement of the surface; the patient also complains of frequent chills, and at the same time the skin is dry and hot. In other cases, instead of restlessness, I have known the patient to be remarkably drowsy, yet unable to sleep, owing to the pain and irritations of the system, and, in some instances, delirium appears within the first days of the disease. The nervous system also manifests the depression attending this disease, by palpitation of the heart, and a tendency to delirium. The appetite is bad, attended with great nausea and sometimes vomiting. These symptoms also are doubtless ascribable to the intimate connexion which exists between the stomach and other sensible parts of the body; for any violent pain or irritation, as we have seen, especially when seated in organs of great sensibility, is readily communicated to the stomach; this is no less expected when the skin is the seat of the disease, as in erysipelas, in eruptive diseases in general, and especially in the painful tumor now under consideration. The bowels are for the most part costive; but sometimes I have seen it succeeded by diarrhœa, and that in a very short time proceeding to a dangerous degree; for the system, as I said before, is readily exhausted under the sufferings of anthrax. The tumor also, when the disease is about to terminate unfavourably, assumes in a few days a very dark colour; a black slough forms in the centre, and a sharp bloody humor is effused from that part of the tumor; vesications also show themselves on other parts of the swelling, indicating the general sphacelus of the part, that is about to ensue.

But if the patient be well treated, or has strength of constitution to give a favourable termination to the disease, the tumor, instead of the dark livid hue, the bloody sanies and vesications, denoting gangrene or sphacelus, exhibits a different character. It breaks out in many small holes, or little cells, through which pus of good quality flows. The tumor appears like a morass, or

quagmire, of a spongy honey-comb structure, not altogether unlike the convex surface of a placenta, and upon pressing it you find it full of matter beneath and of considerable extent. Frequently, says Pearson, (Principles of Surgery, p. 308,) there are in this cellular texture little caverns, and intercurrent sinuses; and he adds, "that considerable sloughs are thrown off in masses;" i. e. I suppose he means, where sphacelus has been the consequence, for where a healthy pus is discharged, the fleshy substance of the part is not detached as where its texture is destroyed by gangrene. On the contrary, the whole mass becomes gradually condensed, as the parts beneath are filled up. The disease too at this time shows that it is not confined to the skin, but is connected with the cellular membrane and the subjacent parts. Indeed they appear united, and so intimately that each cell appears to find its exit by a corresponding aperture in the skin. The size of the tumor sometimes extends to six, eight, ten, or twelve inches diameter. It is also of long duration, say from three weeks to three months; very much, however, depending on the manner of its termination. Where the destruction of parts does not take place by sphacelus, but a healthy pus is poured out, it usually heals in three or four weeks; not so where a large excavation is made by mortification of the part, and where for the most part the disease proves fatal.

This leads me to notice the ravages of this dangerous disease. This disease is very generally traceable to a vitiated habit of body, especially of a scorbutic sort. The same idea is expressed by Bromfield, for he makes two kinds of anthrax, that from a great quantity of blood highly inflamed, and that the effect of a putrid and malignant fever; and speaking of these, he adds, "a bad habit of body from the vitiated state of the circulating fluids, which, producing fever of the most malignant kind, must always be attended with the utmost danger." (p. 120.)

My observation has been that simple phlegmons, ending in large abscesses are the more common consequences of plethora when unattended by the vitiation of the habit before mentioned. These, indeed, are not unfrequent from that fulness of the vessels alone, though in some instances they too are ascribed to the supposed peculiar gouty humor floating in the system. But the anthrax we have described is not merely the effect of such fulness alone, but generally arises from an additional

vitiation of the system. In the first place, I observe, it usually appears in old age, when such change of the state of the system is most apt to occur. The greater number of cases which I have seen have appeared in advanced life; and where it occurred in women, it has been after the cessation of the menses, and in those too of a plethoric make and who have lived a sedentary life, and whose secretions had become more or less impaired; but in habits of this description you will also see it at any age. 2. I have observed that in all I have attended, they were more or less subject to eruptive diseases, especially to erysipelatous inflammations. In the case of Mr. H——e the disease was preceded by, accompanied with, and followed by eruptions, and those of a very obstinate character. This too is an observation made even by Galen, that vesicular eruptions generally precede carbuncles. Galen De Tumoribus Præt. Nat. See Assalini, Neale's translation, p. 54. The same idea is expressed by Willan, (that anthrax like erysipelas, is attended with an extraordinary heat, creeping and pricking under the skin.)

TREATMENT OF THE DISEASE.

After what has been said of the time of life, and the vitiated state of the system in which this disease usually occurs, and the great prostration of the vital powers which appears to characterise it in its progress, you will be induced to believe that venesection is rarely indicated; indeed the circumstances which have been mentioned generally, forbid the use of the lancet, yet there are doubtless cases of great fulness, where it will not only be justified, but may be absolutely necessary in the forming stage of this disease; but it must be done with due reference to the state of the system, as in other diseases in which local inflammation is conjoined with a vitiated habit of body, as in dysentery, typhus, cynanche maligna and puerperal fever, &c. Indeed we may denominate this tumor a typhoid phlegmon. In general, however, you will trust to evacuations from the bowels and attention to the skin, particularly the latter; and as the strength of the patient is early impaired in this disease, and the stomach irritable, the purgatives you employ should be such as are least offensive and least debilitating; such as rhubarb and magnesia, an infusion

of senna and manna, or castor oil, if they can take it; but let me recommend to you, with the view to the state of the whole system, as early as possible to induce perspiration, and to preserve the skin in this condition, for by such diaphoresis you both lessen the local irritation and counteract that general condition of the habit that appears to constitute an essential part of this disease. This should be accomplished by the use of warm bathing; bathing the feet and legs in tepid vinegar and water, and by the ordinary warm drinks that have been directed in febrile diseases. If the stomach be not much disturbed, an ounce dose of the spiritus mind. and laudanum may be given, or the saline draught of Rive-rius, with advantage, during the first days of the disease; but in a short time you will have occasion to keep up such diaphoresis by wine whey or an infusion of the Virginia snake root, for as the tumor advances, its malignant character shows itself with a general typhoid tendency in the whole system. The applications which you will make to the tumor itself in the first or inflammatory stage with most advantage, will be a soft light bread and milk poultice, fomentations of vinegar and water; a light vinegar poultice; cloths wet with the sp. mind. and laudanum; but lead water should be carefully avoided. Dorsey recommends blisters to the part as preferable to every other local remedy; and afterwards the parts to be dressed with basilicon ointment, and if poultices are applied they are to be light, he observes, and frequently changed. But of blisters I have had no experience, but if useful, they doubtless must be so in the early forming stage of anthrax; in such case I believe they may be useful as in other tumors, but not in the last stage. The second stage of the disease having arrived, your object will be to obtain suppuration, that is, a healthy action of the vessels of the part. This can only be done at this time by stimulants and tonics, and these both generally and locally applied. It is most strange that writers should talk of an anthrax healing without suppuration, yet such is the language of Wiseman, of John Pearson, and countenanced by the Edinburgh system of practice in this disease. The best tonics to effect this object both of supporting the general strength and of causing a healthy action in the part, are the Peruvian bark, bitters, snake-root, and the mineral acids. The bark is to be preferred, and in substance, if the patient can receive it. William Fordyce recommends it to be taken in drachm doses, in conjunction with a few

drops of mineral acids every hour; this, for reasons advanced, when speaking of typhus fever, must be proper. The diet should correspond with the medicine prescribed; it should be both the most nutritious and the most stimulant; wine should be given ad libitum, and in every form, consulting the taste of the patient. Wine alone, wine whey, in the form of caudle or panada, or with sago, &c.; brandy milk-punch is also, in some cases, preferable, being most acceptable to the patient. Soups, if the patient has an appetite for them, (but usually they have no appetite; on the contrary they generally manifest the greatest disgust to animal food in every form in which it can be presented,) may also be given, especially strong beef tea. In some cases I have even given my patient eggs and oysters, where they have called for them, that is, when the patient is free from fever. Opium you will find indispensably necessary both to allay pain and to procure sleep. It is quite as useful here, as in mortification of the toes, as recommended by Mr. Pott, and for the same reason; for great pain and irritation is doubtless a means of increasing inflammation whenever it is seated in any highly organised and sensible parts of the system, and in which of course there is a great tendency to sphacelus. In this disease, accordingly I have found opium of infinite use, both administered through the day in small doses, and at night to procure sleep. The nitrous æther, or Hoffman's anodyne, or the tincture of hops in severe irritations may suffice to allay the sufferings of the patient, or at least they will prove valuable auxiliaries for this purpose. The local applications in this stage of the disease should also consist of the most powerful stimulants, such as bark with spirits or yeast, or yeast alone, or spirituous washes and applications, or the yeast poultice, &c. as already noticed in the treatment of sphacelus, and when healed the part should be washed with rum to remove any remaining morbid sensibility. The decoction of the woods is also an excellent drink to correct the general state of the habit. The occasional use of the warm bath, and attention to diet, will also very much contribute to the same end. From the cases I have treated I have come to the following inferences. 1st. That the treatment by lead water and the ordinary relaxing poultices and ointments made use of in simple inflammatory phlegmon, are injurious in anthrax and should be avoided, excepting in the first two or three days of the disease. 2d. That the stimulating and antiseptic ap-

plications are called for and are found peculiarly beneficial. Accordingly too, the cases which have ended successfully in this city have been treated by the last mentioned means, while those which have ended fatally have been treated by the antiphlogistic system. Dr. Rush mentions another case cured by the same means. Extirpation has been proposed, and by others, as by Kirkland, Cooper, and the Edinburgh practice, it is recommended that the parts be freely dilated and discharged, as in phlegmon; but this practice, in most cases, becomes at least unnecessary, and as the parts have a great disposition to bleed and to sphacelate it must be certainly improper, or done with much caution. A case where the knife was so employed was followed by a fatal sphacelus. Another application that has been recommended is to cover the centre of the tumor with lime, and the edges with lint moistened with chalybeate wine, (see Edinburgh Practice,) but in my opinion bark and yeast are to be preferred. In the time of Galen the Falernian wine was made use of as a local application in wounds and in tumors of this description. It was no bad application. Rum is better. Arsenic recommended as early as by Agricola, and has been used in the form of orpiment and Plunket's caustic. Ledran preferred corrosive sublimate; Riverius caustics; Pouteau the actual cautery. But Mr. Good, (vol. ii. p. 290,) justly observes that radical success must, after all, depend upon supporting and giving strength to the system by cordials and tonics, for if this cannot be accomplished, it is perfectly clear that the predisposition will be neither subdued nor subside spontaneously; that the ulcerations will not heal, and the system must gradually sink under their constant discharge and irritation." I should have added that in case of sphacelus actually taking place, the carrot poultice, or the poultice of carbon, or the fermenting yeast poultice may be applied to correct the fœtor and to renew a healthy action in the parts affected.

LECTURE XXXVII.

PHRENITIS, OR INFLAMMATION OF THE BRAIN.

THE term Phrenitis is derived from the Greek word φρεν, the mind, supposed to be seated in the brain. Dr. Cullen gives the following definition of this disease: "Pyrexia vehemens; dolor capitis; rubor faciei et oculorum; lucis et soni intolerantia; pervigilium; delirium ferox vel typhomania:" meaning by this last term, what the Greeks usually associated with it, a degree of coma, or heavy stupor, with delirium, lethargy, and madness. These are the characteristic symptoms. Dr. Cullen acknowledges that he added typhomania to his definition, to designate the coma attendant upon that form of the disease, which appears to reside in the brain itself, as distinct from the membranes; but he adds that, upon further reflection, he finds no foundation for this; and that the symptoms he has included, always mark the acute inflammation, i. e. of the membranes; while the other of the parenchymatous exhibits a more chronic affection. This chronic character is his only mark of the latter form of the disease, without pointing out its insidious character. Dr. Cullen divides phrenitis into idiopathic and symptomatic. At the first view of the symptoms already related, we should be inclined to consider it always symptomatic of fevers of great excitement, in which we generally observe more or less of affection of the brain and nervous system. It is symptomatic also of typhus, worms, eruptions, as erysipelas, hydrophobia, injuries of the brain, and strong passions, particularly severe grief. But dissection has shown it to be an idiopathic as well as a symptomatic disease, and that although attended with general symptoms of synocha, it is still a true idio-

pathic inflammation of the brain or its membranes. Sauvages, Linneus, and Sagar divide it into inflammation of the brain and its membranes; i. e. into phrenitis, denoting the inflammation to be seated in the membranes, and cephalitis or sphacelismus, as seated in the larger vessels, or in the substance of the brain itself. This distinction, you will perceive, I have adopted for the reason that it furnishes an important practical distinction in the sick room. Dr. Cullen says that he admits the full force of the distinction between inflammation seated in the membranous parts, and that which is seated in the parenchyma of the viscera, (yet in his *Nosology*, as you have seen, he can pronounce all such distinctions visionary;) but he considers it very difficult to make such distinction in the present case of inflammation of the brain. Willis, Langrish, Huxham and Pringle have all related cases of abscesses being actually formed in the substance of the brain, when the symptoms of inflammation have been inconsiderable, or not at all to be observed; therefore such inflammation must have previously existed in the brain, but not in the membranes, and consequently should have been designated by Dr. Cullen; indeed Dr. Baillie (see *Morb. Anat.* ch. 25.) observes, that the most usual termination of inflammation of the substance of the brain is in abscess. Dr. Fordyce has observed that when seated in the membranes the pain is acute; but when seated in the substance of the brain that it is obtuse and less sensible; so in hydrocephalus, the pain is at first not acute, yet certainly, judging from the effects, inflammation exists previously to the effusion of water. Dr. Parr remarks, if in any part of the body, this distinction between membranous and parenchymatous inflammation be called for, it is in inflammation of the brain. We may observe that when inflammation is seated in the brain itself, all the symptoms of inflammation are comparatively mild; i. e. almost all the symptoms of membranous inflammation of the brain are present, but that they exist in an inferior degree; see my *Nosology*—read the distinction of species. Dr. Good, I perceive, has adopted the same distinction. Cephalitis comes on with a slight head-ache, increased heat of the head, a disinclination to motion or business; if a child, it is generally found reclining its head upon its mother's lap, upon a chair, or against some substance near which it may be sitting; the pulse in the first instance is quickened, but it is comparatively full; at least, it is not corded as in membranous inflammation; but as the

disease advances, the pulse becomes more slow, and more full, attended with coma. The pain too is deep seated, and considerable stupor follows, occasionally interrupted with sharp shooting pains; the pain, however, is not constant. Cephalitis ending in hydrocephalus, generally attacks those of irritable and nervous temperaments; not so much the full habit; hence it has been generally remarked, that feeble and sickly children are most usually the subjects of it; and hence too the erroneous and absurd inference, that dropsy of the brain is a disease of debility, and the still more absurd negative practice arising from this error, instead of the antiphlogistic treatment, which alone can snatch the little patient from the danger that awaits it. To Dr. Rush again we are indebted for a correct view of the pathology of this disease, and for pointing out its inflammatory character. Dr. Cheyne, who wrote in 1808, also is entitled to much credit for inculcating the same doctrine in Great Britain. The disease now is even denominated, in consequence of this association, phrenitis infantum, or phrenitis hydrocephalica. (See an early description of this disease by Wm. Paisley, Ed. Ess. vol. iii. by Dr. Whytt, in 1768.) The symptoms, as they affect the head, are more like those of congestion in the last stage of fever, or as in apoplexy. Cases of this sort occurred in two young ladies whom I attended, one of this city, and the other of Baltimore. They had all the characteristic symptoms of hydrocephalus internus; while labouring under this disease, they frequently awoke in the night with very acute distress in the head. "Oh, my head! oh, my head!" was their frequent cry, and then again they would collapse into the stupor attendant on such congestion. But besides the quickened circulation and the distress it created in the brain, this disease is indicated by the white furred tongue, the dry skin, great heat of head, fulness of its vessels, high coloured urine, a costive state of the belly, the loaded and heavy eye; in the first stage, the preternaturally contracted pupil, frequently too expressing the distress of the head by habits of frowning, and in the more advanced stage of the disease, squinting, or the turned up eye; both the effect of an irregular action of the external muscles of the eye. These are pathognomonic of this disease. But as the disease advances, the pupil dilates in proportion to the congestion that is produced; in a word all the symptoms of inflammation of the membranes are to be discerned, but in an inferior degree.

But the symptoms of phrenitis where located in the membranes are generally considered as most important to be known. I think otherwise, for those which attend upon membranous inflammation cannot be mistaken, while those of the inflammation seated in the parenchyma, and which constitute the first stage of hydrocephalus, are generally very obscure, compared with those of the membranous inflammation, and are accordingly apt to be overlooked not only by the family and friends, but also by the physician. But in many instances, it is to be observed, that the inflammation is not exclusively confined to the membranes, or to the substance of the brain, but that both partake in whichever of the two the disease may have commenced. On this account, probably, Dr. Cullen was led to the remark that these two species are not to be distinguished, and hence has given no species or division of his genus, but even includes many of the genera of Sauvages, Linnæus, and Sagar, under one head. In membranous inflammation the pain of the head is very acute and unceasing, attended with shooting from one part of the brain to the other, and occasionally with corresponding transient flashes of light affecting the optic nerves and retina; these are attended too with a throbbing of the carotid and temporal arteries. Sometimes the pain is most severe in the forehead, at other times in the occiput, but more frequently on the top of the head, with a sense of burning, conveying the sensation of burning coals on the top of the head, or, as the patient expresses it, he feels as if his very brain were on fire. The pain frequently too extends to the very surface of the scalp. At this we are not surprised, after seeing the communication of inflammation to the brain from the surface in erysipelas. Case of Dr. Bayley's patient on board ship, in which the soreness of the scalp pointed out the seat of injury in the brain, and led to the successful use of the trephine. The eyes also denote the great irritation which exists. They are inflamed; the vessels of the tunica adnata are loaded as in idiopathic ophthalmia; the eyes are also painful and very sensible to light; frequently too, flashes of light pass across them; they exhibit fierceness of look, which is very manifest to the ordinary observer. In some a wild acute stare, and a remarkable quickness in the motion of the eyes are very characteristic of the impulse that is within. The hearing too is affected; at first it is quickened, but afterwards deafness ensues. This, however, takes place,

most commonly, at the close of the disease, and is the attendant upon the form which is among the consequences of the preceding excitement or inflammation, and of the effusion which follows it. The countenance is flushed, not only pointing out the general excitement of the system, but evidently marking an extraordinary impetus in the vessels of the brain, and a great determination to the head. The manner of the patient also shows great agitation of the whole nervous system; he is hurried, agitated, anxious, impetuous; both mind and body partake of the irritation. The pulse too is frequently hurried like the whole system, hard corded or incompressible. Respiration corresponds with the circulation; it is also quickened, and as is to be expected when the nervous system is violently invaded, it is anxious, analogous to what we see in the yellow fever; indeed there is some resemblance in the operation upon the brain and nervous system in these two diseases. There is also more or less too of irritation about the præcordia, showing itself in frequent sighing. The skin is hot and dry, and about the face and neck particularly flushed: (not so in inflammations in other parts of the body.) The tongue is furred and covered with a white paste, attended with great and inordinate thirst. The urine is high coloured, almost bloody, but in the advanced stage of the disease it is sensibly diminished in quantity, that is, when the current of fluids becomes great to the brain, analogous to the scarcity of urine in dropsy: when it becomes dark coloured in the last stage, it is considered by Dr. Lobb, (see his Practice of Physic, &c.,) as an unfavourable symptom, being, as he expresses it, partly hemorrhagic; that is, the thinner or serous parts of the blood are chiefly directed to the part diseased. The bowels are costive; the secretion of bile is, in some cases, increased in the beginning, and is attended with bilious vomitings, hence has arisen the mistake of some physicians, confounding phrenitis and yellow fever, forsooth because the stomach is a good deal affected as symptomatic of nervous irritation.

As phrenitis advances in its progress the flow of blood determining to the brain increasing, the secretion of bile is diminished. The fœces lose the yellow colour; they become white; this too, according to Dr. Lobb, is a fatal symptom in this disease, the pathology of which is, that it denotes a very inordinate determination to the brain, and hence a diminished circulation to

the liver. The brain and nerves continue, as the disease advances, to manifest a still more unfavourable train of symptoms. Delirium in two or three days shows itself; the first evidence of it is incoherence in conversation, and a false imagination. He supposes his friends, and those immediately about his person, to be his greatest enemies, and constantly meditating evil against him. He becomes jealous of every thing passing. He becomes very irascible, is easily excited into violent passion, even at his favourite connexions and servants, resisting the directions that may be given. He is, for the most part, unable to sleep, and when he for the moment may forget himself, dreams of a very distressing nature agitate him, but he has no recollection of them when awake; he is totally unconscious of what has passed; and when awake he is alive to every impression; such is his susceptibility, that even a whisper takes his attention. In a case related by Dr. Good, a similar sensibility in the organs of vision and hearing took place: "insomuch," says he, "that the slightest light and sound, even the humming of a fly, were insupportable." (Vol. iii. p. 329.) True delirium ferox follows. He picks at the bed-clothes, catches at flies; the *muscæ volitantes* are before him; he gets out of bed, manifests great strength and even violence; he requires force to confine him; he swallows his food and drinks with great hurry, and that with a convulsive effort, and sometimes hiccups, for the nerves of the diaphragm participate in the disease; in a word, it becomes perfect mania of the acute sort. Stoll relates an extraordinary instance of the chronic inflammation of the brain that ended in mania, but not till it had been of nine weeks continuance. *Rat. Med. sect. iii. p. 175.* Delirium is one of the characteristics of this inflammation, though not of the *phlegmasiæ* in general, except synochal fever. In the *phlegmasiæ* the general excitement too, is frequently as great as in a general fever without local inflammation, yet frequently no delirium takes place; but in this disease, phrenitis, delirium appears among its earliest symptoms, not only because the disease is seated in parts, which inflamed, possess great sensibility, but particularly because it at the same time involves the seat and source of all excitement, the brain itself, to which the inflammation usually extends; whereas, in the other *phlegmasiæ*, seated in other distant parts of the body, the excitement of the brain is taken off; the current has a different direction, with

the exception of ophthalmia, and that variety of erysipelas we have noticed called sideratio, and as we shall find also to be the case in obstruction of the lungs as in paripneumony. In those cases delirium is induced and easily accounted for: in the two former by a direct flow of blood to the brain, and in peripneumony by the resistance which such injection of the lungs makes to the circulation through the chest, and thereby to the returning blood from the brain. I might have added another of the phlegmasiæ, in which delirium is a common attendant symptom; diaphragmitis, in which this disturbance of the brain proceeds from the irritations of the important nerves distributed upon that muscle. Such are the symptoms from the third to the sixth or seventh days of the disease. A different train now succeeds, denoting the termination of the inflammation, either by coma, the effect of effusion in the brain from the inflamed vessels, or we see a livid countenance, with coldness of extremities, involuntary discharges of the fœces and urine. In some instances this surcharged and excited state of the vascular system is followed by hemorrhages from different parts of the body, as from the nose, mouth, stomach, bowels, kidneys, attended with some symptoms of a general typhoid state of body, but these are of short duration when compared with the preceding excitement.

The following are among the unfavourable symptoms which now succeed, and which indicate a fatal result:

1. Coma with deafness. 2. Grinding the teeth. 3. Hiccup.
4. An irregular pulse and small. 5. The stools becoming white, or clay coloured, or 6. Hemorrhages from the bowels, colouring the stools. 7. Dark coloured urine, or urine mixed and coloured.
8. Retention of urine from the loss of sensibility in the bladder.
9. Cold sweats and coldness of the extremities. 10. The involuntary discharge of the fœces and urine. 11. Convulsions; these occurring at an advanced period of the disease, are invariably fatal. But to aid you in your prognosis, let me also recount some of the symptoms which announce a favourable termination of this formidable disease.
1. Early hemorrhage, especially from the nose. 2. Spontaneous and copious sweating, or sweating easily induced. 3. Diarrhœa in the first stage of the disease.
4. A plentiful flow of urine. 5. The pulse losing its corded character, becoming full and soft. 6. Disposition to natural sleep, not comatose or attended with dreams, and the remembrance of

his dreams, if he has any, but it is preferable he should have none. When the disease may have ended fatally, upon examining the brain after death, the effects of the inflammation are manifested in some instances by the effusion of blood that has been extravasated. In some cases the vessels and sinuses of the dura mater are all loaded and distended with blood, while in other cases where the brain itself is the original seat of the disease, or subsequently involved, we see the effusion of pus. If the inflammation be located exclusively in the membranes, an adhesion is oftentimes found of the dura mater to the skull, and the membranes themselves thickened. (See Boerhaave and Van Swieten, Aph. 775.) In some cases the dura mater is covered with a gelatinous matter, an additional membrane; in some few cases it has been known to end in gangrene. Sometimes too, ossification has been found in some of the membranes, even of the pia mater, the effect of the plethora and inflammatory action, as in the cases of the deposit of earthy matter in the kidney, which I have before related. The vessels, as I remarked, are not only all loaded with blood, but the ventricles also are frequently found distended with serum constituting hydrocephalus internus; and in some cases the serum is found diffused between the membranes as well as within the ventricles, so that we find both forms of hydrocephalus, the externus, as well as that within the ventricles. But how shall we distinguish phrenitis from those diseases which we have enumerated, to which it bears a close resemblance? How shall we distinguish it from mania—from synocha—from typhus? From acute mania it is not distinguishable; on the contrary, it is identified with it; I mean where mania proceeds from bodily causes, as intemperance, fever, violence, &c. From chronic mania it is easily separated; this stage of madness being without fever. From synocha, phrenitis differs in the pulse. In phrenitis the pulse is more corded—in synocha less so—in phrenitis the stomach is more disturbed—less in synocha—the organs of sense are less affected in synocha, as the sight and hearing—the delirium is much more violent, and comes on earlier than in synocha—the faculties of the mind are less impaired in synocha—the head being relieved in phrenitis, the disease is soon ended—but in synocha the fever frequently continues—the duration of phrenitis is usually confined to six or seven days, and when fatal it proves so generally

in that time. Whereas, synocha, says Eller, is frequently of longer duration, and then ends in typhus. Between phrenitis and typhus the diagnostics are, 1. That the typhoid symptoms of phrenitis are of short duration, and compared with the preceding excitement, are relatively mild. It exhibits less vitiation too, of the general state of the system. 2. In phrenitis the hemorrhages are more violent, and they are the chief evidence of a broken up state of the system, the effect of violent action; the fluids being less affected, as it regards their quality, than they are in a protracted synocha or typhus. 3. The eyes, too, differ; in phrenitis they are inflamed and sparkling; but in typhus they are also loaded with blood, but they are glassy and dull.

CAUSES.

The predisposing causes of phrenitis, are, first:

1. Temperament, especially the sanguine and choleric.
2. Plethora—hence those who indulge in spirituous and fermented liquors, not unfrequently become the subjects of this disease. Hence, too, young persons are the subjects of this disease; and if we include hydrocephalus, we may also say that in childhood there is a strong predisposition to such inflammatory diseases; for at that early period of life, say from the second to the fourteenth year, a much greater proportion of blood circulates upon the brain, for which reason it is that hydrocephalus is the effect of other febrile diseases. Indeed Dr. Gregory of London, considers it as so identified with the febrile diseases of children, that he even says it is usually known by the name of the “infantile remittent fever.”
3. Having once had the disease, the brain becomes afterwards liable to returns of it, as we see to apoplexy and mania; even so of hydrocephalus. (See Van Swieten.)
4. A hot climate, and the hot seasons of temperate climates—hence coup de soleil, or stroke of the sun, which is inflammation of the brain; but in temperate climates phrenitis is comparatively a rare disease, except as symptomatic of fever.

The exciting causes are

1. Mechanical violence, as a blow on the head. I have known a case of an Irish woman, who, throwing a pail of water out of the window, threw herself along with it—phrenitis was the consequence.

2. The sudden suppression of accustomed discharges, as the sudden suppression of milk, of the menses, or of accustomed hemorrhoidal discharges, is in some cases the cause of phrenitis. Suppression of eruptive diseases, the plethora in like manner of gout, sudden check of the lochia has induced the mania—the plethora of pregnancy; and especially the circulation called into increased action by the irritation of parturition, has thus induced phrenitis, as well as the more common effect upon the brain, convulsions. In some in pregnancy the mind is peculiarly affected; the moral principle disturbed, showing a propensity to swear, to steal, in those too, who are very abhorrent at those things in a perfectly healthy state of body.

3d. Excessive exercise of body, especially in a hot climate, and in the hot seasons of temperate climates.

4th. The heat of the sun—*coup de soleil*; easily renewed, and frequently assumes the general symptoms of synocha, or the fever with which phrenitis has frequently been confounded by some of our physicians.

5th. Spirituous liquors are a prolific parent of this disease. Most of the cases of acute mania in our asylum, are, I believe, occasioned by this cause.

6th. An exciting cause is excessive exercise of the mind, either intense application alone, or intense thought, with great anxiety of mind, or the indulgence of strong passions. Love, and religious fanaticism have, in this way, been the cause of phrenitis or acute mania. Intense application of the mind to business, and anxiety, induced this disease in the late Mr. Cheetham.

7th. Want of sleep is also an exciting cause of phrenitis. In other words, this may resolve itself into the former; i. e. excessive exercise of mind, the effect of watchfulness.

8th. Excessive venery has produced this disease.

9th. Poisons; viz. copper, mercury, and arsenic.

Case of phrenitis, induced by eating fish, caught on the copper banks. Dr. Bayley. Cases of hydrocephalus from mercury—and learn a caution as to the repeated use of this metal for supposed worms, or in fevers in young children, lest you create this most formidable and fatal of all the diseases. (See Bedingfield on hydrocephalus internus: p. 27.) In the first stage of this disease, I apprehend that mercury is very injurious—that it only serves to increase the febrile symptoms. (See also, p. 16, 21.)—

read Blackall too, on dropsies—Parry also. Such are the sources of idiopathic phrenitis. Symptomatic phrenitis is most generally the effect of synocha; infantile remittents; pestis; yellow fever, or typhus in its various forms. But in some cases, it is the attendant of smallpox, measles, and other inflammatory diseases—then the effect of suppressed eruption. In some cases, it is the attendant upon the first stage of fevers; in others, it supervenes upon the last stage of febrile diseases, and is the effect of local congestions. Phrenitis being a symptomatic, as well as an idiopathic disease, we hence can readily account for the epidemic phrenitis which has been described by Saalman, in the 32d vol. of the Leipsic Trans. called “Acta Erudita.” In some cases, he states the phrenitis he describes to be intermittent, either returning daily, or every second day. The blood drawn in it, too, he observes, has not always the buffy coat; (but which is to be expected in most continued fevers.) Bedingfield made the same observation. The delirium, too, in his phrenitis does not come on until the fifth, sixth, or seventh days. A very accommodating species of phrenitis truly—almost as much so as Beglivi’s yellow fever, noticed by Dr. Miller, in which it was not proper to give a purge till the seventh day. Saalman also remarks, that the epidemic phrenitis he describes frequently terminated in pneumonia. It therefore surely must have been general fever, but not phrenitis. He observes, too, that it attacked the old as well as the young; and that it was most fatal to those above forty years of age; and that the hypochondriac and melancholic temperaments were most subject to it. That they should readily take fevers to which their fears alone would predispose them, is not improbable; but that they should be most liable to attacks of phrenitis is indeed most extraordinary, and is contradicted by all experience. The treatment of idiopathic phrenitis demands our chief attention; but we may remark of symptomatic inflammation of the brain, that our remedies should always be prescribed with great caution, paying due regard to the peculiar cause; the character of the fever indicating it, and the stage of the disease, as well as the habit and strength of the patient. In the first stage of the disease, if it be synocha, yellow fever, or typhus, as we have already remarked, the use of venesection, active purges, or blisters is indicated; but in the last stage, a more cautious, and, sometimes, a very contrary treatment may be

called for. In the treatment of idiopathic phrenitis, general venesection, repeated even to syncope, says McBride, is a good practice—until a state resembling apparent death, says Dawson, (p. 71.) No regard should be paid to the quantity drawn. An abatement in the violence of the affection of the brain should alone determine the frequency of bloodletting, or the quantity drawn. Indeed, I would remark, that bloodletting oftentimes fails in the removal of active inflammatory diseases, by the common practice of physicians, directing the limited number of ounces to be drawn, instead of urging it to be continued and repeated until a mitigation of the disease is perceptible. Twenty or thirty ounces drawn in the forming, or early stage of phrenitis, will do more than three times that quantity drawn at different times. In these inflammatory diseases, too, the patient bears the loss of blood without the same deliquium or sense of exhaustion that he would experience under other circumstances. The man who in health would faint at the loss of a pint of blood, under the excitement produced by phrenitis or gastritis, enteritis, or other inflammatory disease, seated in sensible parts of the body, will bear the loss of two or three pounds without the least inconvenience; and at the moment of drawing it will perhaps not exhibit the least evidence of the change and depression which will in a short time be perceived from it. Venesection, too, in the foot may perhaps be more useful than from the arm, upon the principle of revulsion. Burserius is favourable to this principle. (See also *Med. Recorder*: paper on blood-letting, by Dr. Ducachet: vol. iii. p. 461: also vol. v. p. 187.) Local blood-letting by leeches, cupping, division of the temporal artery. Opening of the jugular vein is recommended by Hoffman, Cullen, Ellis, Dawson. These last are unnecessary, and sometimes attended with difficulty, and indeed danger in delirium. They are also improper on account of the tight bandaging of the head and neck, to close the divided arteries and veins.

Purging.—Saline purges are preferable; or, calomel and jalap. These should be frequently repeated. It is also usual with most writers to advise blisters to the head, which should be invariably shaved; but, query, would it not be preferable to apply them successively to the wrists and ankles—to the arms and thighs? And do not blisters, applied to the head, like the inflammation of erysipelas, rather invite an increased quantity

of blood to the brain, as well as to the outside of the head? I am of this opinion, and am confirmed in it by the so common failure of them in hydrocephalus. Diaphoretics, antimony and crem. tart., or antimony and calomel blended; or sp. mind. and laud. Camphor is very generally recommended by practical writers, as beneficial in this disease of excitement; and, by the by, this is an indirect evidence that it is not the powerful stimulant that it is represented; and if this medicine be proper in phrenitis, it is assuredly a poison in the typhoid state of fever, in which also it has been recommended. If perspiration be desirable in phrenitis, encourage the use of the diaphoretics by tepid drinks. For the same reason, too, the warm bath and the pediluvium are indicated, to aid in relaxing the surface. And for the same reason, cold applications to the head, cold water, cold vinegar and water, cloths wet with æther, the spirituous applications recommended by Mr. Bedingfield, (see his Compendium, p. 37, first. ed.) and the clay cap recommended by most practitioners, Cullen, and Thomas, and Good among the rest, should be totally prohibited. Perspiration, with the aid of blisters, will do infinitely more good in diminishing the determination to the brain; and if the irritation of blisters, or the discharge by perspiration, be useful in lessening the excitement within, how is it possible that cold affusions can be proper or justified upon any principle whatever? On the contrary, do they not, by diminishing the quantity of blood in the external vessels, increase the fulness of those within? And do they not, by diminishing perspiration, add to the fulness of the vessels of the brain? They did so in the very case related by Good, (p. 330.) He had nearly lost his patient, but he was saved by Dover's powder and diaphoresis. (Ibid.) Diuretics are also useful medicines in this disease; i. e. such as do not operate by exciting the system. The nitrate of potash is among the best of this class of medicines: gr. x. or gr. xv. may be given every two or three hours in drink, or in combination with the diaphoretic medicine with advantage, in this disease. Digitalis may also be prescribed with advantage in phrenitis. If it ever be useful, it will be so in this case. But it is not to take the place of any of the remedies that have been mentioned. It may be employed as an auxiliary, but is not to be trusted alone. Belladonna, stramonium, hyosciamus, have been used by Baron Storck and others. When this disease, as is sometimes the

case, proceeds from suppressed menses, we are told always to attend to this habitual discharge, and to see that the menses are restored. This is not always practicable, and indeed it is unimportant, if other vicarious evacuations be substituted; for we know that the state of that function is intimately connected with the general plethora of the system, and not on local fullness, or congestion alone, as contended for by some writers.

Diet.—Bread and water, or at most, sago, arrow-root, gruel, or barley-water. Sub-acid drinks; crem. tart. and tamarinds.

Regimen.—The position of the head and shoulders should be elevated, for the purpose of diminishing the flow of blood to the brain—this is essentially important. Avoid light, heat, noise, business, conversation. Have as few attendants as possible; none but those necessary for the purpose of administering to the patient should be present—more disturb him. In a word, let the most rigid antiphlogistic, or sedative treatment be in every respect strictly pursued, as it regards medicine, diet, and regimen. And when the patient has become convalescent from this invasion of the brain, remember that inflammation may be easily renewed in this organ, the seat and source of all sensation. Let him, therefore, return very cautiously to his accustomed diet, and particularly to the use of animal food, wine, and other stimuli, composing his diet in a state of health. And let him still more cautiously return to his ordinary pursuits, especially if of a professional sort, as they in a particular manner occupy the mind.

LECTURE XXXVIII.

OPHTHALMIA.

THE eye is at all times an organ of exquisite sensibility to impressions, but when it becomes the seat of inflammation the sufferings connected with it are peculiarly severe and dangerous, not only to the organ itself, but so numerous are its nerves, and so immediately connected with other important senses, and with the brain itself, that such inflammation is frequently transferred even to the brain, and thence involves the whole system in disease. In this manner I have seen ophthalmia a fatal disease. It is at all times important, and calls for active treatment on the part of the physician. Recollect that the eye has several pairs of nerves bestowed upon it, besides several branches of other pairs not immediately belonging to it.

1. The optic. 2. The ophthalmic branch of the fifth pair, the trigemini, and which holds extensive connections by means of its other two branches, the superior and inferior maxillary. 3. The *motores oculorum*, which are distributed upon the straight muscles of the eye. 4. The *trochleatores*, or *pathetici*, which are spread upon the oblique muscles. 5. The *abductores*, or *abducentes*, the sixth pair of nerves proceeding to the abductor muscles; and 6. A branch of the seventh pair, auditory, that is, coming from the *portio dura* of that pair. Seeing then that the eye holds such extensive communications, we are taught the importance of active treatment whenever it becomes the seat of inflammation, for such is the determination to parts thus highly organised that they readily become overwhelmed. The characteristic symptoms of ophthalmia, according to the definition given of it by Dr. Cullen,

are great redness and pain ; intolerance of light ; attended for the most part with an increased flow of tears. (*Rubor et dolor; lucis intolerantia; plerumque cum lacrymatione.*) Dr. Cullen divides it first into idiopathic and symptomatic ophthalmia. The idiopathic he again subdivides into the ophthalmia membranarum, that is, as seated in the adnata and its subjacent membranes, and the ophthalmia tarsi, or the inflammation seated in the lids, more especially in the sebaceous glands, or glandulæ meibomii which beset them. These when inflamed are swelled, followed by more or less erosion and a glutinous exudation, which occasions them readily to adhere after being kept in contact, as is the case in sleep. But you cannot readily have one of these parts inflamed without the other, that is, when seated originally in the membranes; the tarsus is, in that case, soon involved, and vice versa, the tarsus being the primary seat of the disease the inflammation is soon extended to its membranes. Mr. Ware, indeed, who has seen more ophthalmia than almost any other man living, expresses the opinion that the greater part of the cases of ophthalmia which occur, originate in the lids, and from thence communicate to the eye itself; and that very few cases occur that spontaneously originate in the membranes. The symptomatic inflammation of the eye, Dr. Cullen also divides under two heads. 1st. As symptomatic of some other disease of the eye itself, as trichiasis, or entropium, that is, the hairs of the lids turned in upon the eyes. 2d. As symptomatic of diseases of other parts of the body, or of the whole system, as, scrofula, syphilis, measles, scarlatina, fever, or phrenitis. When the disease is seated in the membranes, or eye-lids, the whole eye soon manifests the presence of an unusual flow of blood to the part; small serous vessels now carry red blood that before were not at all or scarcely perceptible. In some instances, the eye becomes blood-shot by the effusion of blood from some of the vessels that may have been ruptured by the new determination that takes place. The patient at first has the sensation of some foreign body in the eye, and is not easily convinced that this is not really the case, arising merely from the turgescence of its vessels. This sensation is soon succeeded by acute pain, and frequent flashes of light passing before the eye; a great flow of tears now takes place; these too are not only increased in quantity from the whole surface of the eye, and from the lachrymal glands, but the discharge itself is

changed in its qualities, and is rendered very acrid. They are in such quantity that they pass over the lids, and in some instances, scald the cheek as they flow, producing even an erysipelatous inflammation of the face; and those which pass by the natural channel into the nostrils inflame that passage also, and in connection with the inflammation extending from the eye, have induced fistula lachrymalis by the inflammation induced in the ductus ad nasum; but the inflammation not only changes the secretion from the surface of the eye and that of the lachrymal gland, but the secretion of the eye-lids is also affected by it; the secretion by the nose also partakes of it. These organs, indeed, mutually act one on the other. If originally seated in the lids, as Mr. Ware observes, the membranes become affected, and if in the membranes, the lids, in their turn, frequently show it. Hence it happens, that we see the lids adhering in most cases of ophthalmia, whether originating in the lids or in the membranes. But the inflammatory action of this disease is not confined to the eye itself, the whole system frequently manifests it by the general febrile symptoms attending it, and which are those of synocha, showing itself in the circulation, respiration, the various secretions, and excretions, and, indeed, more or less in all the functions of the system; for the most part, however, such is the determination to the head, that the patient complains much of headache as well as pain of the eye, great sensibility to the light, throbbing of the carotid and temporal arteries, and of flashes of light frequently passing through the eye, as in phrenitis. In some instances, as already intimated, the brain itself becomes the seat of inflammation, and renders it a fatal disease.

Ophthalmia has various terminations: in some instances, as in other inflammations of secreting surfaces, it is removed, 1st. by resolution; or, 2d. it ends in an increased secretion, and by purulent secretion from the external surface; and when such discharge takes place externally, it affords relief analogous to the relief afforded by purulent discharges from other inflamed surfaces, as the nose, throat, or surface of the lungs; and, indeed, this is another example of a purulent secretion, without actual ulceration or destruction of parts but from a mere change in the state of the exhaling vessels, as in gonorrhœa, phthisis, &c. &c. 3dly. In other cases ophthalmia terminates by an effusion of pus internally, behind the cornea, constituting hypopion, (so called from

υπος, under, and *πυον*, pus,) or in a less degree, in which a very partial or inconsiderable discharge takes place behind the cornea, when it is called, from a resemblance to the circle on the nail, *onyx*, from *ονυξ*, a nail. 4th. Inflammation of the eye in some cases ends in a thickening of the membranes, the seat of the disease; the whole sclerotic coat becomes thickened; in other instances the cornea is rendered opaque, and is totally lost in the general disease of the eye; and as ossification was found in phrenitis, so in ophthalmia it has been known to be attended with an ossification of the coats of the eye, and indeed may have had some agency as a cause of the inflammation. 5th. Ophthalmia in some cases produces a disease of the crystalline lens, either obstructing the lens itself, or the capsule investing it; in either case *caligo*, or cataract, is the consequence; inflammation is not always the forerunner of cataract; it is sometimes the effect of congestion from age. 6th. Inflammation of the eye is, in some instances, succeeded by amaurosis, or a paralytic state of the retina, the extension of the optic nerve upon the posterior part of the eye. (See Trucke's *Historia Ophthalmiæ*.) 7th. Ophthalmia produces a new growth of vessels upon the *adnata* constituting *membrana*, or film. This receives the name of *pterygium*, from *πτερυξ*, a wing, bearing some resemblance in its shape to a bird's wing. 8th. In other instances, it ends in a large effusion, within the eye, of water, or pus, constituting a dropsy of the eye, producing in either case, a great distension and overgrowth of the eye, which occasions it to protrude from its socket far beyond the lids, insomuch that the lids can no longer cover but a small portion of the tumor thus produced. This *hernia*, or displacement of the eye, is now denominated *staphyloma*, from some supposed resemblance to a grape. It looks, however, in many cases, much more like a blood peach than it does like a grape. In this state of things it is not unusual for the action of the muscles compressing the eye to produce a rupture of the eye itself. 9th. It frequently ends in *sphacelus* and death. These being the consequences of inflammation of this important organ, it necessarily calls for all your attention; and let me entreat you, in every case to which you may be called when you may enter into practice, to keep these terminations before you as a possible event, if you should omit the use of those means which are indicated in a disease seated in an organ of so much sensibility.

CAUSES OF OPHTHALMIA.

Predisposing—1. The sanguine temperament. 2. A plethoric habit of body, especially kept up by intemperance; sensibility induced by—3. A former attack. 4. Change of climate from a cold to a hot one, or from a clouded atmosphere and short days, to a clear atmosphere and a long day. These changes induced ophthalmia in the British troops in Egypt. 5. Debility and consequent increased sensibility. The effect of disease predisposes to ophthalmia, as after fever and the confinement it produces. In like manner women after the confinement of parturition and the debility attendant upon it, are liable to this disease. 6. A diseased state of the constitution, as scrofula or syphilis predisposes to ophthalmia. The exciting causes of ophthalmia all resolve themselves into irritation applied to the eye itself, as—1. By mechanical injury; a blow and a black eye we know to be very generally associated; but the red or inflamed eye usually precedes the black. 2. Inversion of the eye-lids or trichiasis. A case is related by Dawson, (nosology, p. 57,) in which this disease had been of forty years duration—the effects of hairs which were removed as fast as they reappeared. For the first seven years they reappeared—they were conquered at last. 3. Sand or lime is a frequent exciting cause of inflammation. The sands of Egypt are a productive source of ophthalmia, independently of other causes in that climate and country. The sands of America produce the same disease as those of Egypt. During Lewis and Clarke's travels up the White Earth river, the party were tormented with sore eyes occasioned by sand which was driven from the sand-bars in such clouds as often to hide from them the view of the opposite bank. The particles of this sand are so fine and light that it floats for miles in the air like a column of thick smoke, and penetrates every thing. "We were compelled," says the writer, "to eat, drink, and breathe it very copiously." (Quarterly Review, 332, January, 1815. Lewis and Clarke's Travels to the Missouri.) 4. Chemical stimuli may be enumerated. The nitrous fumes of the soil of Egypt, and especially the sharp effluvia after the retreat of the Nile, consequent upon its overflow, are of this sort. According to Sonnini and Sir Robert Wilson, these are among the most frequent causes of that disease; and hence they account for the fact, that in Cairo diseases

of the eyes are almost universal; blindness and ophthalmia are met with at almost every step in that city. 5. Excessive exercise of the eye, as in looking at minute objects, sitting up late at night, and over exertion of the eyes in writing or reading. These sensible organs readily become affected, if not by active inflammation, great weakness is the result. 6. Excessive quantity of light suddenly let in upon the eye. The new born infant, is very liable to inflammation of the eyes, especially if its attention be long and steadily attracted by the fire or a candle immediately upon birth, when it has just emerged from its dark abode. In like manner ophthalmia is a common consequence of snow when of long duration on the ground. 7. The heat of climate. 8. Cold, by the sudden suppression of the secretions, is a very common exciting cause of inflammation, especially in persons who have before suffered an attack. 9. The diminished excretions attendant upon other diseases and sometimes the morbid materials of other diseases induce sympathetic ophthalmia, as syphilis; not by metastasis, as maintained by Dr. Gregory, of London, but by the matter of gonorrhœa directly applied to the eye—scrofula, fever, erysipelas, measles, scarletina, catarrh, and small pox, and bowel complaints. Cases are related by Dr. Whythe of Edinburgh, in which ophthalmia invariably followed disorders of the stomach and bowels; but these probably, as well as ophthalmia, were the effect of a suppressed state of the excretions by the skin. A tenth exciting cause is contagion. In this way inflammation of the eyes by the purulent matter excreted, is frequently communicated by contact, as at boarding-schools—in regiments of soldiers, and in families, where several persons frequently wash in the same basin, and wipe upon the same napkin; for it is now ascertained that the sphere of the contagion of ophthalmia is limited, and as Mr. Edmonston observes, is chiefly ascribed to contact, analogous to the purulent ophthalmia of new born infants, which Mr. Gibson of Manchester, and Mr. Ware, suppose to be excited by the acrid discharges of the mother, that is, in cases of leucorrhœa preceding or attendant upon the birth of a child. But is this not always the case? Other causes may satisfactorily account for this effect, as already remarked. By this communication between the soldiers in Egypt, it is probable this disease was rendered communicable, and in this way conveyed to Malta, Gibraltar, and England, as well as, in a few cases, to the

United States. Some of the regiments returned with many soldiers totally deprived of sight. Yet seeing that the matter of leucorrhœa and of gonorrhœa applied to the eye produces a similar purulent eye, is not the purulent eye of Egypt thus propagated, and not by a specific material—seeing that such specific material is not necessary, as any matter from another diseased surface will excite inflammation, applied to that tender organ the eye? The contagious character of this disease, as it first appeared among the British soldiers, although it may have had its origin in that country, has been very generally believed. Numerous and decided testimonies, says the *London Medical Review*, (vol. i. p. 15,) leave us not at liberty to doubt that, though believed to be peculiar to Egypt, the same disease has been imported into England. (See also *Welsh's Journal of the campaign in Egypt*, p. 182. *Power's attempt to investigate the ophthalmia of Egypt*, 1803. *Treatise on ophthalmia*, Ed. 1806, p. 48. *Dewar's Inaug. Diss.* 1804.) Do not all the facts on the contagiousness of ophthalmia, admit of explanation in the manner already pointed out?

TREATMENT.

In the treatment of idiopathic ophthalmia, our indication is, to remove the remote causes as far as possible. Where it arises from a foreign body, as sand, lime, or other substance, it should be removed by a probe or by immersing the eye in water.

2d. To diminish the quantity of blood flowing in the vessels of the eye and the neighbouring parts, and to diminish the general and local excitement attendant upon the inflammation of that sensible organ, and

3d. When such inflammation has been subdued, to restore the tone of the debilitated vessels, to remove the consequences of the preceding inflammation, and thereby to prevent a return of the disease.

The exciting cause being removed as far as practicable, we are next to take off the momentum of the vessels of the part inflamed; that is, to diminish the volume and the velocity of the blood circulating upon the diseased part. This is to be done,

1st. By venesection general and local, by the lancet; it is not

necessary, however, that it should be carried to deliquium, as recommended by Mr. Vetch; yet, copious, large, and repeated blood-letting is indispensably necessary. In like manner, cupping, leeching, and scarification, should be made use of to empty the vessels of the parts affected; not, however, by the rough grains of wheat!! as recommended by the author of the Edinburgh Practice of Physic; but by the lancet or a delicate knife, or the small curved scissors. In the use of scarification, let me also advise you to confine it to a division of the congeries of vessels at the inside of the lower lid, and not as is customary, pass your lancet and knife across the membranes of the eye itself. This mode of scarification is extremely painful, and adds to the irritation instead of diminishing it; but applied to the part mentioned, and the vessels freely divided, or a portion of them cut away with the scissors, which is preferable when they are very numerous and large, you obtain every advantage that can be desired, for it empties the vessels of the whole eye, as far as scarification can accomplish it.

2. Cathartics are an important means of depletion in this disease; and for the purpose of exciting large discharges, and at the same time diverting irritation from the part affected, they should be active; such as the saline cathartics and the active purge, so frequently recommended, calomel gr. vi., jalap gr. xv., and the super tartrate of potash gr. xv. combined. Kirkland objects to the saline cathartics in ophthalmia, particularly, but, I believe, without good reason; on the contrary, they are among the best purgatives we can employ in this or other inflammations.

3. Sudorifics, such as have been mentioned in phrenitis, are also called for in ophthalmia, viz: sp. mind. and laud., the antimonial solution, small doses of antimonial wine and laudanum, or calomel and James' powder, with the addition of a small quantity of opium; or Dover's powder. Scarpa's prescription is, antim. tart. gr. i.; decocti hordei Hiss.; crystal tart. ʒi., sacchar. ʒij. M. You perceive the addition of laudanum or opium in most of these diaphoretic medicines, not only because they aid in that respect the operation of the medicine with which they are combined, in relaxing the surface, but for the purpose of diminishing the great irritation which inflammation produces when seated in parts of so much sensibility: in such cases opium is peculiarly useful. The practice indeed of Mr. Ware is to apply the vinous

tincture of opium or laudanum itself to the eye, by dropping one or two drops into the eye, two or three times a day; he observes that, although it occasions a momentary excitement, it produces permanent ease to the patient; and that he has prescribed it with great success, after the necessary evacuations have been made from the system. As in inflammation of the toes, opium was found useful by Dr. Pott; so it may prove beneficial in diminishing ophthalmia. After venesection and purging especially, you need not fear its stimulating operation upon the system; but before evacuations have been made, you have great reason to apprehend injury from its sedative operation upon the circulating system, and especially the smaller vessels, in consequence of which the larger are more distended, and thus inflammation ultimately increased; this you will find a common event of the too early use of opium in inflammatory diseases. Mr. Bedingfield also, I find, concurs in the use of opium after scarifications; after the parts have ceased to bleed, he recommends that the eye be kept constantly moistened with a watery solution of opium, from one to two grains of the extract dissolved in an ounce of water, to be applied cold or warm, as the feelings of the patient may indicate. I have no doubt of the benefit of this application.

4. Blisters behind the ears, to the temples, or between the shoulders, are also found useful remedies in diverting the inflammation from the parts affected. But let me caution you against their application immediately over the eyes, as directed by some. They are in that case so near the parts affected, that they are more likely to increase than diminish the inflammation; but the greatest objection is, that a portion of the ointment may find its way to the inside of the lids, in which case it must assuredly aggravate the disease.

5. Setons are advised, by many physicians, in ophthalmia, as preferable to blisters. In chronic inflammation, a remedy of more permanent operation is, perhaps, in many instances, to be preferred; but in a sudden and acute inflammation, you require the more active effects of a blister; but in habitual scorbutic or serofulous affections of the eyes, I prefer the more durable irritation of a seton; for, like the disease, setons may be considered as chronic remedies, for it indeed requires time for them to produce the necessary irritation and discharge. In like manner McBride recommends, in habitual ophthalmia, small issues to be made, by

passing a thread of silk or cotton through the lobes of the ears, and daily to render them still more active, by means of some blistering or other irritating ointment, applied upon the thread at the time of moving it. Issues in the arms applied by making an incision with the lancet at the insertion of the deltoid muscle, and inserting a pea, or by the application of the patent issue plaster, are also advised in ophthalmia by many practitioners. I have prescribed them in chronic cases of that disease certainly with benefit; but in acute ophthalmia, blisters are to be preferred.

But, 6th. What applications shall be made to the eye itself, in this state of excitement and inflammation? Many, even in recent cases of this sort, advise cold applications; others recommend the eye to be frequently bathed with cold water; some direct cold poultices of scraped potatoes, or the pulp of rotten apples, to be applied to the eye; and most agree in recommending cold lead water, and that constantly applied; but cold applications are in my opinion injurious in all local inflammations, and much more so in parts of so much sensibility as the eyes; and you will find in all such cases that the pain and inflammation are both aggravated by the stimulating effects of cold. Samuel Cooper observes that if cold applications be painful, they should be applied warm. Baron Pery, in his *Memoirs of Military Surgery*, also recommends not only the eyes but the head to be frequently washed with warm vinegar and water, not cold. This bad effect is to be expected, when we recollect that the eye is a secreting surface, and that cold applications diminish those very secretions which, it is undeniable, should be promoted. In the first years of my practice, I adopted this treatment in ophthalmia, but very soon found to my surprise, that although lead water might, in some cases, give momentary relief, the burning, itching, and pain very soon returned with a manifest increase of the inflammation, probably from the check given to the discharge. But we may certainly obtain all the sedative and beneficial effects of lead without the disadvantage of cold applications; applied moderately warm, I have certainly found it an useful remedy; i. e. after venesection and other evacuations have been prescribed; but before these means of depletion have been employed, it is certainly a dangerous prescription and should be totally prohibited. In 1814, a case occurred in this city, where very destructive effects proceeded from the application of lead water in erysipelas, accompanied with ophthalmia. The fol-

lowing is the form in which I make use of this medicine: *R.* acet. plumb. \mathfrak{z} ss.; acet. distill. \mathfrak{z} ss.; laud. \mathfrak{z} ij.; aq. pluvial. \mathfrak{z} viiij. *M.* I usually direct a linen cloth, folded and wet with the liquor, to be applied to the part affected, renewing the application when it may become cold. But before the system has been depleted, I usually have recourse,

7th. To applications of warm rain water, milk and water, to weak vinegar and water, or to diluted sp. mind. \mathfrak{z} ij. and laudanum \mathfrak{z} ij., \mathfrak{z} vi. aq. pluvial.; or where the parts are extremely painful, to fomentations of poppy heads. This Dr. Bard found peculiarly serviceable in his own case; it is also highly recommended in the last edition of Cooper's Surgery. After the remarks already made, on the effects of opium, it is not improbable that the poppy heads were equally serviceable with the soothing effects of the fomentation derived from its warmth; the practice of Mr. Ware is certainly favorable to this explanation; he also advises all his collyria to be applied warm. Mr. Dawson (see Nosology, p. 56.) also observes, "where the eye is highly irritable and painful, I should prefer warm water, applied with a sponge and reserve the cold saturnine or similar washes, such as the sulphate of zinc, or the muriate of mercury, until the irritation and pain has partly subsided." Another application which you will find very serviceable in promoting a secretion from the eyes in ophthalmia, and which is well calculated to allay the irritation and to diminish the sufferings of your patient, is the application of the common poultice of bread and milk; but, for this purpose, it should be boiled until it is perfectly smooth, and then spread thin between a fold of cambric or fine old linen; this should be laid over the eye, and be frequently renewed, say every three or four, at most every six hours. Whatever application you may make through the day, you will find this cataplasm an excellent anodyne for your patient through the night, when the symptoms are usually aggravated. Another application, which many physicians prefer for active inflammation of the eyes, is a poultice of the slippery elm bark; some again make use of an infusion of quince seeds, flaxseed, or the pith of sassafras, a teaspoonful to \mathfrak{z} viiij. of water, or common barley water.

These applications are all mucilaginous, and therefore calculated to allay irritation in the parts to which they are applied, at the same time that they afford a soft defence from the action of

the air, upon the inflamed surface of this very sensible organ. The hop poultice, by its anodyne qualities, is also found a very soothing and useful application in this disease. But notwithstanding all these various applications, in some instances the inflammation continues, and even is increased with a manifest fullness of the eyes, and thickening of its coats; and perhaps a beginning protrusion of the cornea, and an opacity of that coat of the eye. In such case it has been proposed by Mr. Wardrop to lessen the bulk of the eye, and to take off the tension of the inflamed parts by a discharge of the aqueous humour, by puncturing the corner of the eye with the knife used for extracting the lens, and to introduce it at the same part where it is introduced for that operation, and to such an extent as to make an incision as broad as the knife. Many cases are lately published by that gentleman, of the success of this remedy. Mr. Ware has also made use of it with the best effects, and recommends it to be done early, to prevent rupture from some parts which might otherwise prevent the return of vision. It may therefore be considered as a very important addition to the means of diminishing inflammation, especially when it involves the internal membranes of the eyes, and is likely otherwise to end in the destruction of that organ. (See *Edin. Med. Jour.*) In one case which I attended, in conjunction with an eminent physician of this city, I proposed, in such protrusion, to discharge the humours of the eye, as I once did in a former case, with the best effect. It was opposed. It ended fatally. I now exceedingly regret that this mode of puncturing the eye had not been made use of at that time.

The second indication being fulfilled; i. e. the inflammation being removed, we are next to restore the tone of the debilitated parts, and to remove the consequences which such inflammation may have produced.

1st. A morbid sensibility frequently remains, attended with a lax and distended state of the vessels. A sort of passive inflammation remains; the part yet unattended by pain, or the febrile symptoms of the first and active stage of the disease. In this stage a solution of the sulphate of zinc, composed of the strength of one grain to an ounce of rain-water is an useful application, and should be frequently applied.

Let me here guard you against the absurd and unchemical

compound of vitriol and lead, made use of by some physicians, and recommended, too, even by Dr. Dorsey, in his *System of Surgery*, (vol. i. p. 293.) and I perceive by Dr. Gregory of London. It is like some of Dr. Brown's prescriptions for his mixed debility; i. e. supposing direct and indirect debility, to exist at the same time. So you have here the opposite qualities of stimulant and sedative in the same prescription: viz. the sulphate of zinc and the acetate of lead. Their decomposition ensues, and new combinations are formed.

In your prescriptions, let me advise you always to observe simplicity; otherwise your practice is uncertain, and for the most part inert. One of the greatest improvements our profession has received, has been the abandonment of the complex farragos which made up the prescriptions of older physicians; and the adoption of a more simple mode of administering medicines. While the former practice was intended to counteract particular predominating symptoms, the latter strikes at the root of the evil, by removing or counteracting its cause. In the first stage of the disease, if the means of diminishing inflammatory action be indicated, and lead be preferred as a sedative, make use of it; but in the second stage, when stimuli are called for, use the vitriol, and which you will find a valuable stimulus. Many other means are employed for the purpose of restoring tone to the debilitated vessels: a wash of brandy and water, cold water alone, the alum curd—made by coagulating the white of an egg by alum.

In the second stage of ophthalmia, when seated in the tarsus, it is not unusual for a chronic enlargement of some of the glandulæ meibomii to remain, constituting the hordeolum or sty, attended with fresh inflammation; in other cases, the tumour remains in an indolent state, without inflammation. In these cases, one of the best applications to resolve these obstructions, and to restore the excretion from those organs, is the white precip. of mercury, which is the sub-muriate of mercury and ammonia, the sal alembroth of the alchymists. This is the basis of the celebrated ophthalmia ointment of Janin, so much recommended by Cooper and others; viz. *R* axung. ʒss.; bol. armen. ʒij.; prepared tutty, ʒij.; white precip. ʒi. M. When ophthalmia terminates in the pteryguim, or film, covering a part or whole of the eye, and the active inflammation is removed; in the first place, with the curved scissors

or knife, remove such portions as can be conveniently detached from the subjacent coats of the eye. In other instances, we may divide by the knife or the lancet, the principal vessels which may nourish such newly formed production. Still some portion will remain, obscuring the eye, or a part of it. Mr. Ware directs in such cases, æther to be applied to the part, by means of a camel's-hair pencil. Sometimes he adds to it one-third or one-fourth of the solution of corrosive sublimate. With these even an opacity of the crystalline has been removed. Others again, under similar thickening of the coats or films, apply verdigris with sugar; viz. 1 part verdigris, 6 parts sugar; or red precipitate, 1 part, sugar 6 parts; or sugar and alum, equal parts; or sugar and nitre. In such case I have seen repeated instances of the removal of those remains, by the application of a still more simple remedy—molasses, dropped into the eye two or three times a day. It probably acts by exciting the absorbents which have become inactive. The same remedy, I recollect, was earnestly recommended by Dr. Shippen. When the disease is symptomatic, attend to the cause. If produced by syphilis, mercury is the only resource; if the effect of scrofula, you must resort to bark, alteratives, seawater, and sea-bathing; and use tonics to prevent the return of ophthalmia. In this case, both the local and general application of cold will be beneficial.

The diet, in ophthalmia, should be very simple—avoiding every thing that can excite the system—avoid light—keep your patient in a dark room—protect the eye by a piece of green silk, either hung loosely before it, or covering a piece of pasteboard; but especially avoid all close bandages—even goggles are too warm—they increase both the heat and sensibility of the eye.

LECTURE XXXIX.

OTITIS.—ODONTITIS, &c.

OTITIS, inflammation of the ear, derived from *ovs*, an ear.

The ear, like the eye, is an organ of great sensibility, more especially in children. It derives this sensibility not only from the distributions of the portio mollis of the auditory nerves upon the internal, and the portio dura, on the external parts of that organ; but the sublingual branch of the inferior maxillary nerve, that is, a branch of the fifth pair, also by its union with the chorda tympani, a branch of the portio dura, holds communication with the ear, and in consequence of this connexion we are led necessarily to attach more importance to the diseases of this organ, because through that medium such diseases sometimes affect the brain, and indeed the whole system. For an illustration of that connexion, let me refer you to the valuable work on the diseases of the ear by Saunders; the distribution of the fifth pair of nerves you will also see beautifully exhibited in the work of Walther, and a plate of the same in the Berlin Transactions. Otitis is generally considered as an inflammation of the meatus auditorius externus. Wilson defines it *phlegmasia cum dolore auris internæ sæpe cum delirio*. But it is not confined, as many suppose, to the external ear; nor is Wilson right in limiting it to the internal ear; both are frequently involved in the same inflammation, depending on the degree of it, the cause producing it, and the habit of body in which it occurs. Slighter cases of it, especially from cold, will perhaps only affect the secreting surface of the external ear, and the inflammation confine itself to the ceruminous glands, and the excretories, analogous to the ophthalmia tarsi. It produces spongy granulations, (assuming the appearance of a polypus;) in others it leaves what Saunders denominates an herpetic

ulcerous eruption, and this sometimes such as to close the passage, obstructing even the entrance of sound. These cases are generally cured by the forceps, injections, ointment of mercury, and caustic; while in other cases, it seats itself upon the membrane covering the tympanum, or even extends beyond it to the internal ear, and affects even the membrane lining the mastoid cells, and thence perhaps to the brain itself. Accordingly in Saunders you find cases terminating in the very destruction of all those organs; not only showing itself in the ordinary purulent secretion which takes place from the external ear, and which perhaps may remain for sometime comparatively harmless, but in other instances the tympanum is destroyed, and the whole chain of bones, and the nerves and muscles connected with it, even the very membrane lining the mastoid cells is destroyed, and the cells themselves filled with pus; followed, says Saunders, in some instances, by an exfoliation of the external lamina of the mastoid process: but this is not all, it not only ends in the destruction of the organ of hearing, it also extends itself to the brain, and involves the whole system in disease, and frequently proves fatal. Vogel states, that in this manner it sometimes proves immediately fatal on the first day, and very often destroys the patient before the seventh. The late Mr. M'Kie, of this city, an ingenious and promising youth, was thus cut off by inflammation of the brain, induced by inflammation of the ear, to which he had been very subject from childhood; it ended in a loaded state of the vessels of the brain, producing all the symptoms of apoplexy; that tergeſcence in all the vessels of the head, was manifest after death. But in other instances, this inflammation ends in abscesses and tedious ulcerations, with a total destruction of the organ of hearing. It appears, then, that there is not sufficient importance attached to inflammation of this organ; indeed some nosologists omit it altogether. Vogel, however, has given it a place as a distinct genus, the forty-eighth among his inflammatoriæ, calling it, "*Inflammatio auris internæ, dolor immanis in aure, febris, cephalalgia, agrypnia, delirium.*" With these facts before us, we are taught both to give it a place in nosology and to give attention to this disease not only as a disease of the ear, but, in some instances, as a disease involving the brain and the whole system; for a disease that occasionally terminates fatally cannot be correctly viewed in any other light. The

symptoms of this disease are, pain in the ear; this is very acute and distressing, and being seated in parts of great sensibility, and sometimes extending to membranes of a dense structure, as those composing the tympanum, and the membrane lining the mastoid cells, less severe when confined to the ceruminous glands, and the excretories: but in either case the pain attendant on inflammation of the ear is not always confined to the ear itself, but affects the side of the head. The general circulation is excited, attended with heat, thirst, delirium, coma, &c. The most common exciting cause is cold, as the use of a cold bath when the body is heated, and persons once having suffered it are very liable to returns of it. It is occasionally also produced by other causes, as catarrh, scarlatina, cynanche maligna, and syphilitic ulcers of the throat. Hence, then, the disease is very properly divided into idiopathic, as that from cold, and symptomatic, when induced by other diseases, as those just enumerated; this is the most dangerous

TREATMENT OF IDIOPATHIC INFLAMMATION OF THE EAR.

Every old woman or nurse thinks she understands this disease, and the treatment of it. Not so. Venesection sometimes is required in full habits, purges, or emetics, bathing the feet, small doses of antimonial wine and laudanum; laudanum is useful here, as in other inflammations seated in parts of great sensibility. Dover's powder, or sp. mind. and laudanum; blisters behind the ears, or to the neck. These are very necessary and important; the application of a mustard plaster, fomentations to the side of the head. Poultices of bread and milk and laudanum, or of hops infused in vinegar and water, protecting the head at night by a flannel night cap during the disease, but not afterwards, as it renders the person more liable to cold. If the pain be very severe, injections of warm milk and water will be necessary, or warm oil and laudanum may be applied in drops, or by inserting a piece of cotton or wool moistened with it. The common domestic remedy sometimes has a very soothing effect, as the clove of a roasted onion. In some instances much injury is done by stimulating and spirituous applications in this stage of the disease; for instead of effecting resolution they add to the excitement, and induce suppuration, if not the more

formidable evils, such as the destruction of the ear, or an inflamed brain. The diet, during such excitement, should be in general simple, as in the phlegmasiæ. When resolution is not produced and it ends in suppuration, or purulent secretion, as soon as the inflammatory stage has subsided, stimulating injections are indicated to prevent such discharges from becoming perpetual issues or ulcers. The sulphate of zinc, as in ophthalmia, I have used with great advantage; in obstinate cases small doses of calomel are said by Saunders to be an important remedy for this offensive disease, gr. ij. daily. Turpentine and oil equal parts, a few drops morning and evening, occasionally injecting and cleansing the ear with soap and water. General tonics are also indicated, as the bark, bitters, cold bathing, either sea-bathing or the shower bath; washing the head and ears daily with cold water is also calculated to lessen morbid sensibility and thereby remove that liability which exists to returns of the complaint, whereas the common practice of washing the head in warm water, bathing the feet two or three times a week in warm water, adds to the sensibility of the system, which invites a return of this or other inflammatory complaints. When the disease has been of long duration, it will be useful both in the cure, as well as to guard against the evils which may arise from checking a discharge that the system has become accustomed to, to introduce a seton, to keep up a soreness behind the ears, or to establish a new irritation by issues in the arms.

ODONTITIS.

More properly than odontalgia denotes the nature of the disease we contemplate under this head, for pain is only one of its symptoms. Dr. Cullen denominates it "*Rheumatismus vel arthrodynia maxillarum a carie dentium.*" This is a very deficient description of this disease; besides caries is but one cause of it; cold, plethora, gout, teething, also frequently induce it. According to Wilson and Thomas, too, it is exclusively a local disease; and by Thomas it is actually so placed among his locales. It is certainly one of the phlegmasiæ; for it is attended with inflammation of the part, and usually with a general fever of the whole system. For the most part it comes on with pain of the part, and and some symptoms of general fever; but also very frequently

the pain affects the whole side of the face, extends to the ear and the eye of the same side, involving the whole side of the head, the irritation following, I may say, the whole extent of the fifth pair of nerves in all its branches, to the eye, the whole of the upper and lower jaw; and it is attended too with manifest tumor and other symptoms of active inflammation; and these are accompanied, in many instances, with great heat, great thirst, increased action of the arterial system, and all the symptoms constituting inflammatory fever. In some instances, the inflammation of the part also, like other inflammations, ends in abscess, which is painful and generally confined to the gum; but sometimes it extends to the cheek, and discharges externally; in other instances it involves the membrane lining the antrum highmorianum and ends there in suppuration. Frequently it confines itself to the jaw, destroying the periostium, and producing a caries or ulcer of the bone itself, and this being connected with the external soft parts, unites them in one mass of disease, discharging the matter of the parts affected externally; this is vulgarly called "tooth-evil." I knew a lady who, on a visit to the eastward, took cold, which she neglected as a mere tooth-ache; the consequence is a disease, which not only will disfigure her face through life, but render those parts liable to repeated attacks, whenever she may be exposed to cold. Can such disease then be disregarded by the practitioner?

CAUSES.

Odontitis usually is ascribed to a caries of the tooth. The nerve of a tooth that is decayed being exposed, doubtless is in condition to be easily acted upon by any exciting cause that may be applied to it; but caries of itself is rarely the exciting cause of such attacks of inflammation; it only acts by predisposing the parts to be excited by cold, by acrid materials, or by the alternate action of heat and cold; either by changes of the atmosphere, or by food and drinks taken either of too hot or too cold a temperature. In such state of the parts, cold is the usual exciting cause of odontitis; its action too is very much dependant on the general irritability of the system. Hence, females are more frequently the subjects of this disease than males, and especially those of a nervous temperament; in pregnancy too, when the natural sensibility

of system is increased, this complaint is still of more frequent occurrence; owing probably, in this case, to the plethora of the blood vessels, as well as greater sensibility of the nervous system and of the particular part. In some instances, however, tooth-ache and pain of the nerves of the face will occur without any previous destruction of the teeth; a fact which shows that such pain arises from pressure of the distended vessels upon the accompanying nerves. But a woman that has a carious tooth, I may say, is sure to have tooth-ache in pregnancy; for the most part even then it is removed by the lancet; but in some cases extraction alone affords relief. I know a lady that has thus lost a tooth with every child she has borne; her teeth were carious, but they were only painful to her during her pregnancy; they were then a source of continual suffering; they were the irritable part, for she experienced no breeding sickness or other evils of pregnancy; by her tooth-ache alone she knew herself to be with child. There is another affection of these nerves frequently met with that is allied to odontitis, I mean neuralgia, or *tic douloureux*, as it is commonly called when confined to this part, either the lower or under jaw, or the side of the face, it was called by Dr. Fothergill, a painful affection of the face, and under that appellation he describes it. (See his works. See Appendix to Thomas.) In such cases, it has been ascribed to lithiasis, or a floating gouty matter in the system, because it occurs frequently in gouty habits of body, another word for a full habit. Here too is another example of an imaginary virus in the system, floating about, and fastening itself upon the brain, upon the stomach, upon the face and jaws, or upon the great toe; gout, cancer, and scrofula constitute a trio that, in the present fashionable views of pathology, disgrace our profession when we view it as a branch of science. Dr. Fothergill considered this to be the cause; but as we shall see that in gouty habits there is a combination both of sensibility and plethora, we need not have recourse to any peculiar humor to account for this disease. Indeed, I consider lithiasis, gout, and those painful affections to be frequently the produce of some causes, both predisposing and exciting; for it is in such fulness of habit that we look for earthy or bony deposits, in the different parts of the body, and in such habits, especially when rendered irritable by free living, we also look for these nervous and inflammatory affections. It is for the same reason that such affections of the teeth and gums are the at-

tendants on dyspepsia, and every dentist will tell you the fact that diseased teeth, the acid stomach, the foul tongue, sordes accumulating about the teeth, the offensive breath, are usually associated; not that the acid generated in the stomach is the immediate cause of caries of the teeth, but that the same condition of nervous system that predisposes to affections of the stomach, also renders the fifth pair of nerves liable to be acted upon by the same exciting causes of disease, as those of the stomach and its vicinity. Hence we find an early decay of the teeth connected with a general debility of constitution. In the present case cold, or rather the alternate operation of heat and cold, are the more frequent causes of odontitis. For this reason, too, it is that we see this complaint, like other inflammatory diseases, the attendant on a variable climate; not so in the uniform temperature either of a hot or a cold climate. The negroes of Africa are remarkable for their fine teeth; so too are the inhabitants of northern countries: a Scotchman is rarely found without good teeth, and those too pretty early cut. (See Galt's Sir Andrew Wile.) The treatment should be as in other phlegmasiæ. In plethoric habits of body, and especially in pregnancy, venesection is necessary. Cathartics, salts, numerous cases of it are cured by this alone, without extraction of the tooth. This is certainly desirable, where the tooth is not much decayed; blisters in some cases necessary; warm drinks, and foot-bathing to relax the surface. With the same view, the spiritus mind. and laudanum may be occasionally administered, both to lessen pain and to remove fever; at night, an anodyne is especially useful, for at that time the sufferings of the patient are most severe, as is usually the case in most of the phlegmasiæ. The part itself should be kept warm; fomentations of vinegar and water, or a vinegar poultice to the jaws, rinsing the mouth frequently with a gargle of vinegar and water, or a decoction of figs, and if suppuration threatens, in the form of a gum-boil, this is also very much facilitated by the same gargle; a poultice of bread and milk applied to the cheek will also assist in promoting suppuration. A prejudice exists against the use of this application, lest it induce suppuration externally: this is not well founded, if attention is paid to temperature in the application. If the tooth be much decayed, as soon as the inflammation is either removed by resolution or by suppuration, whether internally or externally, extract the tooth; in the latter case it is indispensably necessary

to close the wound. In the tooth evil, spirituous applications, a fold of linen, wet with rum; in some instances a projection of fungous flesh will require caustic daily, and rum. But extraction of a decayed tooth is also useful, to prevent subsequent attacks of inflammation of the jaw. It is the common opinion, and well founded too, that it prevents the other teeth from becoming affected; not that caries beget caries, but that irritation is thereby kept up in the jaw, and that the other teeth, that are now sound, are liable to become carious by the same causes that affected the first. For this reason, the sooner a diseased tooth is removed the better; if the tooth be not much affected, and the caries small, it will be preserved by excluding the air and other materials from it, by plugging it with tin or gold foil, previously cauterising the nerve. The pain of this process is very trifling, and prevents a great deal of suffering by destroying the sensibility of the nerve. How are these affections of the teeth to be prevented? and when once affected, how can we prevent the recurrence of these complaints?

Avoid the exciting cause. Avoid the habitual use of hot drinks. The practice of smoking, too, for the same reason, should be proscribed; for, notwithstanding the anodyne effects of tobacco, the hot air, especially from a segar, cannot fail to affect the nerves, as well as heat applied in any other manner. But if smoking must be permitted, the long Dutch pipe, or the Hooker, is less exceptionable than the segar, as the air is less heated when it reaches the mouth. The most effectual means of guarding the jaw against these inflammatory affections are, to cleanse the mouth daily, with cold water, and the brush, and especially after eating, to prevent lodgments of acrid materials, or which may readily become so, and thus excite irritation. A variety of dentrifices are in common use, which are supposed to be useful, both in preserving the teeth, and to guard against these inflammatory affections, to which the jaw and gums are liable. Some of these are really innocent and useful; but others are positively injurious. All the mineral acids are injurious, for they very readily decompose the teeth. The salt and water recommended by Wilson, should be totally prohibited on account of the muriatic acid it contains; yet some persons are in the habit of using salt as the daily dentrifice; others again, make use of snuff. I do not know that this injures the teeth, but it certainly, in some cases, affects the nervous system, produces dyspepsia, and has led to intemperance. Charcoal is a

common dentrifice. Where the mouth is offensive, from bad teeth, or diseased gums, it is peculiarly proper, as it counteracts the offensive breath which they occasion; yet some dentists object to it on account of the pyroligneous acid which it contains; and they allege that by this acid it actually injures the teeth. This is certainly contrary to the experiments recently made on this subject. The best dentrifice, I believe, is that which is composed of calcareous earth, or powdered bone. Thomas recommends a composition of Bol armeniac and calcined bones or horns; aa. ʒij. But besides cleansing the teeth of the foul materials that collect about them, it is also useful to preserve the gums in a sound and healthy state; otherwise they become of a very loose texture, and are detached from the teeth, which thence become loose in their sockets. One of the most beautiful sets of teeth I ever saw, was thus loosened. Not a single tooth was in the least affected. The lotions usually made use of to guard against these affections are, brandy and water, rum and water, with the addition of spirits of lavender, tincture of myrrh and water, or the combination, recommended by Thomas; viz. tinct. cort. per. ʒij.; tinct. myrrh, ʒss. M. These things, although they may appear of inconsiderable moment, merit a portion of your attention; for you will be frequently as physicians, interrogated on these points, as well as called upon to cure the diseases that the neglect of them occasions. Recollect the reply of the celebrated painter Raphael. He was once asked, by what means he had reached such perfection in his art? His reply was: "I think nothing that belongs to it beneath my attention." This reply should be recollected by every student of medicine who wishes to excel in the practice of physic. Every subject which it presents has claims upon his attention.

Inflammation of the gums, attendant on teething, may also, with propriety, be embraced under this head, and deserves our notice. The irritation arising from cutting teeth, manifests itself in various ways; and in some instances, is attended with very serious consequences. The child usually begins at the age of about four months, to cut its teeth. In some instances, they appear earlier, and in others, much later. The child first manifests this irritation, by putting the fingers in the mouth; by listlessness; the gum is swelled and thickened; it is also hot to the mother's breast; the irritation invites an increased flow of blood to the part; the heat of the mouth is increased. The child is restless,

heated, and feverish; starts in its sleep; the cheeks are flushed; skin generally hot and dry, especially in winter, when the perspiration is less. On this account it probably happens, that children cut their teeth with more difficulty in winter than in summer; for perspiration, which is most abundant in the warm season, certainly obviates much of the fever attendant on teething. The stomach is disturbed by vomiting; the matter ejected is acid and hot; the breath frequently offensive; the milk is thrown up frequently, and curdled. This disturbance of the stomach is attended with flatulence, griping in the bowels, drawing up of the lower extremities; green evacuations; and sometimes diarrhœa, and symptomatic dysentery; i. e. more or less of tenesmus, and mucous discharges, tinged with blood. In some cases, the fever of teething is carried off by an increased secretion from the mouth; the child slavers or snivels, almost as in salivation from mercury. In this case, it is oftentimes relieved by this increased secretion. In other instances, an increased discharge, taking place from the bowels, also affords it relief—(hence the remark of Dr. McGrath, in his Scotch dialect, that the child that is teething, must slabber, purge, or die.) In some cases, too, it is relieved by an eruption appearing behind the ears. The eruptions sometimes take place in patches on the cheek, or on the arms and legs, hence called the *strophulus confertus*, by Dr. Willan. The eruption is so thick, that it resembles the rash in measles, tooth rash. Dr. Good erroneously calls it the red gum—this disease is confined to the eruptions immediately after birth—and, as in other eruptive fevers, it sometimes proves critical. In other cases, again, the inflammation of the gums produces ulcers in the mouth: the tongue, the inside of the cheeks, and the gums are covered with small corrosive ulcers, commonly called the cankered sore mouth—the *cancrum oris*, as Dr. Coates calls it—and renders the breath of the child excessively offensive. Sometimes the irritation vents itself upon the glands about the jaw or the neck. They swell, and frequently proceed to suppuration. But the fever, not terminating by some of the evacuations that have been mentioned, or in the eruptions or abscesses, a determination to the brain, ending in hydrocephalus, is the consequence of the continuance of fever. “Hydrocephalus internus,” says Mr. Badingfield, “arises from no source of irritation more frequently than from painful and protracted dentition.” (p. 75.) This disease is, I believe, frequently thus pro-

duced. But a still more common effect of teething is convulsions: yet common as it is, the cause is oftentimes most strangely overlooked by practitioners.

TREATMENT.

If the teeth are protruding, or ready to burst through the inflamed gum, divide the gum freely. No evil can come from such division—no greater resistance to the teeth, as the French allege, from the cicatrix, for it is an established truth, that absorption more easily takes place of recently formed parts. (See Fox on the teeth; 3d edition, p. 86, 87.) “Upon a free division of the gums we must chiefly rely for the prevention or removal of the diseases to which children are exposed by dentition. In less than two hours after the operation,” says Mr. Badingfield, “I have seen the most violent symptoms diminished, and hydrocephalus internus arrested in its progress, convulsions cease, symptomatic fever subside, and in a few days cutaneous eruptions disappear.” (Compend. of Practice, p. 75.) We thereby spare the little sufferers many distressing and painful moments. I have seen them actually gratified in the operation, as they evinced by the manner in which they submitted. In dividing the gum, too, where a dens sapientiæ is pressing upon it in the adult, we sometimes give it instantaneous relief.

Manner of doing it.—A sharp instrument should be drawn in the direction of the tooth—feel it distinctly.

The discharge of blood is also useful. But if the teeth are not so forward, a different treatment is to be pursued; and in this nature almost points out the course to be observed. Increase the evacuations by the mouth, by the bowels, or by all combined. Magnesia and rhubarb night and morning. The advantage is to correct acidity, as well as to open the bowels; but in case of more than ordinary costiveness, a dose of castor oil, and an enema should be given; or a dose of calomel and jalap may be administered. Afterwards procure two or three stools a day, by the use of calcined magnesia. To diminish fever, also relax the surface by warm bathing, general or partial; antimonial wine, either to the degree of exciting full vomiting—say fifteen or twenty drops—or as a diaphoretic; gutt. x. or fifteen every two or

three hours. Or small doses of ipecac.; gr. i.; rhei, gr. ij. M.; once or twice a day. Perhaps you have an aphthous ulcerated mouth—magnesia and the following detergent powder of Barnet, and loaf sugar—1 borax, 2 sugar will be of service. But if the ulcers appear like chancres, destroying the texture of the parts, have recourse to a solution of the sulphate of copper: gr. iv. to \bar{z} i. or gr. vi. Touch the parts frequently, say three or four times a day. A wash of yeast, water, and honey, with a lump of borax dissolved in it, also affords great relief in these painful ulcerations. But perhaps you are first called upon to see the child in convulsions. At this age, say from four months to two years, always recollect this source of irritation of the mouth, as well as in the bowels. But it is a great abuse of opiates when they are given to allay restlessness in children, without previous evacuations; and in this case they frequently serve to beget convulsions. Recollect that convulsions may arise from irritation from fever. Administer an opiate instantly, to suspend the irritation. The aq. ammon. gtt. v. to gtt. x. has been found useful. Warm bath sometimes—while the bath is preparing, an enema, and divide the gums. By this you remove the cause. Is the child relieved, give it a dose of purgative medicine. If the child habitually is liable to convulsions, as is the case sometimes, with every tooth, apply blisters behind the ears; or let the child wear a piece of tape covered with blistering ointment; or put some strong mustard behind the ears, or savin ointment. Like the natural sore ear, this artificial excitement will afford similar relief. Venesection, if of a full habit; afterwards air and exercise will generally, with an open state of the bowels, afford permanent relief. Indeed the confinement of the infant to the nursery, and the want of exercise in the open air, by the relaxation it produces, renders the child more liable to the different causes of irritation, and occasions it to suffer much more when indisposed than it otherwise would do. Sometimes it may be necessary even to administer some tonic, if the child be very much reduced. Chalybeates, gr. iv. or gr. vi. and bitters; elix. prop. if costive. Cold bathing is also among the best means of imparting vigour to a delicate child; for delicate children are usually the greatest sufferers from teething.

LECTURE XL.

PAROTIS.

CYNANCHE PAROTIDŒA, or as it is vulgarly called the mumps, is a contagious pyrexia which chiefly appears in an affection of the parotid gland; which gland receives its name of parotid, from its vicinity to the ear, being derived from the two Greek words *παρά*, near, *οὖς*, the ear. This disease, like other contagious diseases, is occasionally epidemic. For the most part it is so slight as to require little more than confinement and abstinence, with some mild cathartic, and perhaps a liniment and piece of flannel to the part affected. But in some cases it is more severe, both in its general effects upon the system, as well as in the part affected and its vicinity. It is most usually epidemic and manifestly contagious; but is universally met with as a sporadic disease attributed to cold. In some cases the general fever is severe, attended with considerable determination to the head, showing itself in delirium and other symptoms denoting an affection of the brain, and as stated by Dr. Cullen, in some cases it has proved a fatal disease. In such violent cases more active general treatment is called for. Again, in other cases the tumour of the part is so great as to end in abscess of the parotid gland, or terminates in a scirrhus affection of it; and occasionally the tonsils and neighbouring parts partake of the inflammation insomuch that you can scarcely determine which is the primary disease. Where either the general inflammatory fever is violent, or the local symptoms are severe, have recourse to venesection, active purges, the volatile liniment, a blister applied over the part affected; and in young persons emetic medicines, become necessary. Afterwards

small doses of antimonials and other relaxing sudorifics should be continued until the violence of the disease be subdued. Leeches are advantageously employed, and blisters, as in ordinary buboes. Should the inflammation of the parotid or neighbouring parts terminate in abscess, notwithstanding the general and local antiphlogostic treatment, soft poultices and other means of facilitating the secretion of pus, should be employed; but this event is not likely to happen, if the physician does his duty in the early stage of the disease. Usually these active measures are not called for—a mild cathartic, a volatile liniment to the throat, and other parts affected, fomentations of vinegar and water, poultices of hops, with tepid drinks and the pediluvium are all that are necessary. In about four days the disease disappears. Some cathartic medicine should now be prescribed at the termination of the tumour of the parotid, and the subsidence or disappearance of the general febrile symptoms: otherwise it is not unusual for the mumps to be succeeded by an affection of the breasts in women, or of the testicles in men, so peculiar is the operation of this disease upon the glandular system. A case is related by Hamilton, in the Edin. Trans., where the testicle subsequently was carried away, leaving the tunica vaginalis an empty bag! Active measures are taken in the first stage, and upon the disappearance of the disease; but where purgatives are employed these sequelæ are not usual. In some cases a transfer of inflammation, even to the brain, has taken place, constituting an active inflammation of that organ, and which demands all the active treatment called for in idiopathic phrenitis.* When these additional local affections supervene, further depletion, emetics, fomentations, &c., as in the treatment of idiopathic inflammation of these organs, must be had recourse to.

MASTITIS.

Inflammation of the breast and inflammation of the glands of the breast, or mamma, attended with pain, tumour, redness, and if the woman be suckling, a diminished secretion of milk, and fever of the synochal type. The term mastitis is derived from *μασος*, a breast. Besides the characteristic symptoms just mentioned, it

* See the History of Mumps on board the ship Ardent, in Nov. 1807, by Mr. Noble, related in Edin. and Surg. Journal, July, 1808.

is accompanied with the usual characters of fever, viz: a chill, or sense of coldness, and followed by a stricture upon all the excretions, particularly of the lochia and of the milk, as well as of the skin and other secreting surfaces. As the breast contains a great deal of cellular matter, both covering it, and distributed throughout the body or glandular portion of it, there is a great tendency to suppuration; for such is the sensibility of this organ, and peculiarly after parturition, when such affection of the breast is of most frequent occurrence, that the current which sets to the part is very great, and the distention it produces is both very sudden and exceedingly painful. If, however, early and active measures be adopted in the commencement of the disease, resolution is also a frequent termination of the inflammation that affects this organ. Another tendency of this disease is that of scirrhus or permanent chronic obstruction of the glandular part of the breast; but this is the more frequent occurrence late in life, and after the cessation of the menses, and oftentimes is the result of intemperance. Such obstruction, too, frequently ends in a subsequent ulceration, called cancer. But the acute disease of the breast, now more immediately under our view, takes place most generally in women soon after parturition, and during the period of suckling. In one case I have known it to proceed to abscess before labour. It ended well, and the lady makes a good nurse. In another the abscess did not form until labour had taken place. And we may thence consider the debility and sensibility which belong to this condition as in a peculiar manner predisposing to such inflammation. A sanguine temperament and plethoric habit, are also among the predisposing causes of this disease. The milk generally appears in the breast of lying-in women about the third day after delivery, except where they are unusually full habited, and have already suckled many children; in such cases the milk appears the first day, and sometimes even a few days before labour. Not so in the first child bearing—a few days, sometimes even five elapse before the milk vessels are sufficiently developed to pour out a well formed milk. The first discharges are more of a serous nature—nevertheless it is a good practice to put the child to the breast in the first twenty-four hours after delivery, that the breast may perform its functions as soon as possible; for in the mean time, especially after the third day, it is tumid, painful, and distressing, and usually attended with fever, which is thence de-

nominated a milk fever, or the fever attendant upon the first coming of the milk. By early application of the child to the breast and paying attention to the bowels, milk fever may oftentimes be prevented altogether; at least it will be rendered much more moderate, both in violence and duration. In this state, too, the local fulness of that organ predisposes to inflammation upon the least imprudence in diet, change of dress, or exposure to cold. But when the milk has flowed freely, and the breast is inordinately full, it is also liable to inflammation, upon the least imprudence or neglect. Under such circumstances the usual exciting causes are, 1st. Neglect to empty the breasts. 2d. Soreness of the nipples. This is common with a first child. It may be prevented by washing with rum or brandy during the last month of pregnancy. When it occurs, lead water, borate of soda and brandy, or alum in brandy, may be used as lotions; and the breast should be defended by a nipple shield. 3d. Fever, the effect of cold. 4th. Costive state of the bowels. 5th. Suppression of the lochial discharge, whatever may be its character. 6th. The paroxysm of an intermittent. 7th. The premature use of animal food instead of the abstemious diet necessary during the first week after parturition. 8th. The excessive use of hot drinks, spirituous and vinous drinks, gin, panadas, caudle, and those too highly spiced, are frequent exciting causes of this disease, especially among the lower classes, and among the more fashionable. 9th. A heated atmosphere, closed curtains, an excessive quantity of bed clothing, and especially too much covering of the breasts themselves with flannel, and the subsequent exposure of them to the air, which is unavoidable in nursing, also frequently produce an inflamed breast. 10th. Too much company and conversation, depriving the lady of her necessary rest, and by positively exciting her nervous system will frequently be the cause of fever, and consequently render this very sensible and irritable organ, the seat of irritation and consequent inflammation. Under these circumstances, the milk ceases to flow, the breast becomes hard and swelled, and very sensible to the touch; the whole system shows the febrile state, and the other secretions being interrupted, the whole excitement that is the result vents itself upon the breast. What is now to be done? or rather, let us ask first, what is usually done? A most preposterous practice prevails in the sick room upon these occasions. One of the first applications usually

made, is that of applying a composition of rum or brandy and pepper to the parts, the oil of mint, or perhaps a stimulating plaster with nutmegs, oil of mace, and most usually with the view to allay the pain that the poor woman suffers; and in order to counteract the chilliness and sense of coldness attendant upon the first stage of the disease, the nurse administers the usual favourite potation on these occasions. The cup of hot gin toddy, and that perhaps, rendered still more stimulating by combining with it some stimulant herb, as the tansy, mint, or rosemary. On the contrary, instead of these local and general means of adding to the excitement of the system in this disease our indication is as in the other phlegmasiæ, to diminish the volume of blood flowing to the part, to relax the system, and by restoring the various excretions to divert the excitement from the part affected. And such is the sensibility of this important organ, and such is the sensibility of the whole frame under these circumstances, that we must be active in our means of accomplishing these objects or we may be too late; abscess, scirrhus, and sometimes sphacelus, and the total destruction of the breast may be the result. In the forming stage a cathartic, a bolus of calomel, and attention in emptying the breast by the child, or by other means,* will oftentimes put a period to the inflammation; but if the inflammation be considerable when the physician is first called upon, other means must be resorted to, as—1. Venesection in full habits, and leeches; 2. The bowels must be relieved by salts, castor oil, calcined magnesia, or a dose of calomel and jalap; these, succeeded by some of the usual diaphoretic medicines, as the antimonial solution, sp. mind. and laudanum, antimony and calomel, aided by the moderate use of tepid drinks. When these means have been directed and the tumor and inflammation continue, blisters are also very useful and necessary in counteracting the inflammation. Dr. Smith, of Rochester, informs me he has used them with great success in preventing suppuration. This gentleman was our pupil, and does great credit as a practitioner to the

* Should the child give pain, the nurse must apply her own mouth, or glasses must be employed. Some have recourse to the application of a young pup to the breast. In this city there are nurses who make this their living; and go about for this express purpose. One woman more celebrated than the rest, has had her teeth drawn to qualify her for this employment, and lives altogether upon breast milk.

school in which he was educated. He was not one of your fashionables, who prefer their breakfast to a lecture. He was always at his post. He now reaps the reward of his talents and his industry.* Fomentations of vinegar and water, or a soft poultice of bread and milk, or of hops and vinegar, laid lightly upon the parts, and of moderate temperature; these frequently disperse such accumulations; or in slighter cases, covering the breast with a plaster consisting of wax and oil so united that they are of soft consistency. Apply a blister if not soon relieved. The diet in this active stage of inflammation should be strictly antiphlogistic, abstaining from every possible source of excitement in this very susceptible state of the whole system; no less attention should be paid to the regimen of the patient. You must have regard to the temperature of the apartment, of the drinks, and of the local applications; forbid company and conversation, light, noise, and all domestic business and concerns. If the tumor should not be discussed but go on increasing, and symptoms of approaching suppuration show themselves, well boiled poultices of bread and milk, with an additional quantity of ground flax-seed should be immediately applied, or a poultice of the elm bark, (*ulmus fulva*,) until it be dispersed, or suppuration shows itself at a particular part. An early and free opening to discharge the matter should be made up and down : why ? remember the peculiar structure of a gland; if the matter be retained the disease continues, and frequently ends in the destruction of the organization of the breast. This may be prevented by a free incision, and the pain is nearly

* I have received the following letter from him on this subject :

“ *New York*, January 31, 1822.

“DEAR SIR :—Without apology I take the liberty of calling your attention to a remedy for mastitis, which I do not recollect to have heard you mention while lecturing on that subject; and I do it, sir, the more willingly, believing it almost a specific when applied early. I allude to blisters. The mode in which I have used them is, after general and local bleeding if required, to encircle the whole basis of the mamma with an emp. epispat. from two to two and a half inches wide, to remain until free vesication is produced. For the last four years, during which I have frequently applied it, when used early, and aided by the usual auxiliaries, I have not seen an instance of suppuration to follow. And instead of my patients complaining of its being a cruel remedy, they represent its operation as being comparatively mild, for it speedily diminishes the pain and irritation of the organ.

Respectfully yours,

“A. G. SMITH.”

the same whether the incision be large or small; poultices should be applied for a few days after opening, to diminish the inflammation, and to facilitate the discharge, but no violence should be made use of in effecting the discharge.* The discharge plentiful and the inflammation removed, then use plasters of wax and oil, soap cerate, or a mercurial plaster, and perhaps a dose or two of gentle purgative medicine, or a few grains of calomel and antimony may be occasionally administered if you suspect any thing like a chronic obstruction of the gland. It is a good rule to return gradually to a more full diet, otherwise before the local excitement subsides there is danger of renewing the inflammation, and of having more abscesses formed. But in some cases, from want of a proper and free opening of the breast, from repeated attacks of inflammation, or perhaps from the fulness and obstruction that succeed to the natural cessation of the menses, or from sympathetic connexion with a diseased womb, you are called upon to prescribe for a more permanent disease of this organ; the breast is hard and unusually full, the patient complains of acute lancinating pains through the body of it, the glands of the axilla are enlarged, constituting a scirrhus or concealed cancer, or perhaps an active inflammation has been produced in it, commonly but improperly called chronic inflammation, and ulceration has been the result: in other words an open ulcer exists. In this case your only resource is the extirpation of the glandular portion of the breast—not a part of it but the whole of it, agreeably to the very important rule of Professor Richter, of Gottingen. Save the skin if possible, that is, if not diseased, but let all the glandular part of the breast be removed; the consequences otherwise are, a disease of the remainder of the gland; the inflammation created by the operation has probably too some share in producing it; besides, the pain of the operation is nearly the same whether the whole or a part be taken away, and the remainder of the breast is of no use even if not afterwards diseased. I have operated in fifteen cases. In the first I removed only the part affected. I had afterwards to remove the remainder. In all the others I took

* Let me here notice in a word, another abuse of the same nature in the sick room. I mean the practice of nurses in the management of the small tumors of the breasts of new born infants. Squeezing them to discharge supposed milk, and applying rum and pepper and strengthening plasters, instead of the soft poultice, or wax and oil plaster. The violence of nurses generally produces abscesses.

away the whole breast. I need not detain you with observations on the mode of operating; all this will be delivered in another department of this college by the able and practical professor of surgery. There is a great advantage in exposure of the part to the air after the operation, lest hemorrhage prove troublesome. See my paper on the advantage of exposing wounds to the air; (Medical and Philosophical Register;) that is, immediately after the operation, to guard against the return of hemorrhage by a more permanent contraction of the vessels; the parts are then to be brought in apposition and secured by well made adhesive plasters, and a light compress of patent lint laid over the whole wound, both for the purpose of preserving a comfortable degree of warmth and to absorb any discharge that may take place from the wound. But it not unfrequently occurs that an active inflammation takes place in the part and its vicinity, producing considerable tumor, heat, and pain. In such case bathing the parts affected with weak vinegar and water, or a light simple poultice laid over the tumor will be useful; it should be thin, moist, and light; the bowels should be kept easy, and the strictest abstinence enjoined. But after a few days, say five or six, have elapsed, and the inflammatory symptoms have been subdued, and the same is evidenced by a discharge of serous and a mixture of sanguineous and purulent matter, it will be proper to remove the dressings, to bathe the parts with soap and water and rum, to renew the plasters, and the patient to return gradually to her accustomed diet. The part should be dressed daily, and to promote a healthy growth of the parts within, it will be proper to have recourse to the bark, bitters, or some other tonics, with the moderate use of porter, &c. Such is the practice I have pursued in a great number of cases, and with the most favourable results; but to the practice inculcated by Richter, that of removing all the glandular portion of the breast, I ascribe the patient's escape from all subsequent cancerous affections, and which, as I have before remarked, clearly shows that these affections of the mammæ, do not proceed generally from that vice of the constitution to which they usually are ascribed.

LECTURE XLI.

CATARRH, OR A COMMON COLD.

THIS in itself is, for the most part, a disease comparatively of little importance, but in its consequences, if it recur frequently, or be neglected by the patient or practitioner, is of very serious import, and brings in its train other diseases, which inevitably prove fatal. Catarrh I believe to be the parent of more consumptions than all the other diseases collectively to which that disease has been ascribed. Gregory, of London, treats it as of too little importance, and without proper lines of demarkation between its different species. McGrath, when sent for to a patient ill of a cold, was told by the sick man that it was nothing more than a common cold ; he replied, with much good sense, " Man, what could you have worse? would you have a plague?" He was doubtless aware of the alarming consequences to be apprehended from this cause; and indeed it may be said, with truth I believe, that colds have destroyed more than the plague. In this manner I have frequently known a neglected cold end in phthisis, and in those, too, in whom there was not the least predisposition to a pulmonary disease. Seeing, therefore, that such is frequently the termination of a common catarrh, it merits our attention. The term catarrh is derived from the Greek word *καταρρε*, to flow down ; *κατα* signifying augmented action ; (See Good's Account of the affixes and suffixes of medical terms, in his Nosology, and in the first volume of the London Medical Society's Memoirs, 2d series.) thereby denoting the defluxion or discharges from the head and other parts, the seat of the disease. I have formerly told you that catarrh and dysentery both hold an improper place

in Dr. Cullen's Nosology. Dysentery, as I have already shown you, is not only a febrile disease, but altogether of a different character from those which belong to the profluvia. The least attention, too, to the nature of the disease constituting catarrh, will also convince you that Dr. Cullen has very improperly separated that disease from the other phlegmasiæ; indeed Dr. Cullen himself admits, in his note, that although he has placed catarrh and dysentery among the profluvia, that catarrh, from the fever attending it, and the phlogistic diathesis which it exhibits, is most nearly allied to the phlegmasiæ. "*Catarrhus quidem pyrexia et diathesi phlogistica, phlegmasiis maxime affinis est.*" Definition—Pyrexia sæpe contagiosa; muci ex glandulis membranæ narium,* faucium vel bronchiarum excretio acuta; saltem hujus excretionis molimina. This is certainly a bad definition; it exhibits nothing of the inflammatory character of the disease; in my opinion it should be defined an inflammation, not enlargement, as I have through mistake designated it in my Nosology, of the mucous membrane lining the nares, fauces, trachea, and bronchiæ; attended in the beginning with a diminished, but terminating in an increased and morbid, excretion from these surfaces. Sometimes it affects chiefly the head, but not the throat or lungs, and produces a sharp acrid discharge from the membrane lining the nares. This form of the disease Hippocrates called coryza, thereby denoting the sharp defluxion which takes place from the head, and which defluxion he also supposed, by falling upon the other parts of the throat, fauces, &c., to create the inflammation that affects those parts. In some instances it affects the head, producing a great sense of weight and fulness; in that case the Roman physicians gave it the name of gravedo. In some instances it affects the nose with great violence, ending in ulceration; it is then called, from the offensive character of the disease, ozena, from οἷζ, stench, or οἷω, to stink. In other instances it fastens itself principally on the tonsils, being then called cynanche tonsillaris. In others the larynx or

* The membrane called Schneider's membrane; so called from the person who first described it, and who has written six quartos on catarrhal inflammation of this membrane. He, as well as Hoffman, is disposed to extend the term catarrh to the mucous glands in general. Parr also extends it still further, considering even affections of the mucous membranes of the bladder, intestines, urethra, &c. under the same genus, taking in all the mucous tissues of the French.

trachea becomes the seat of its violence, forming cynanche laryngea or cynanche trachealis. In others again the surface of the lungs or bronchiæ suffer most, constituting bronchitis, as Dr. Bedham calls it, which is no more nor less the peripneumonia notha of Sydenham, the catarrhus bronchialis. The old couplet limits catarrh as follows,

“Si fluit ad pectus dicatur rheuma catarrhus;
Ad fauces, bronchus; ad nares esto coryza.”

It may be observed, that whenever it is thus confined to any one particular part, it is much more violent than when the inflammation is more diffused over a greater surface of the membranes mentioned, and whatever may be the part affected, whether the head, tonsils, trachea, or bronchiæ, and the inflammation in that case is not always confined merely to the mucous membranes, but frequently extends to the dense membranes beneath, and to the very substance of the organ affected; the symptoms too are in all respects more violent when thus circumscribed to a part or to a particular organ, but depending also very much on the texture and importance or degree of vitality of the part thus affected. Hence, Celsus was led to remark on this subject, that this disease, when it affects the nostrils, is mild; when it falls upon the fauces, it is worse, but still worse when it attacks the lungs. “Distillat autem humor de capite interdum in nares, quod lene est; interdum in fauces quod pejus est; interdum etiam in pulmonem, quod pessimum est.” (Lib. iv. cap. 4.) The tendency to those different forms in which catarrhus affections invade the system, is very much governed by peculiar circumstances; it depends on the predisposition derived from former attacks, whether it be in the form of hives, affection of the tonsils, or a peripneumony. The sensibility of the trachea, from time of life, and the inability in infancy to excrete or to eject the excreted matter, may lead to the former disease or croup; for we find that disease chiefly confined to infancy, but not exclusively, for adults in some cases are the subjects of it; and in some instances, says Huxham, even the famous epidemic contagious catarrh shewed itself as a pleurisy or peripneumony; so various are the forms which the same disease shall assume, depending on peculiarities of constitution, time of life, the

sensibilities of particular parts of the body, and other circumstances. But catarrh, as it ordinarily appears, comes on with the usual symptoms that announce phlegmasiæ in general, with more or less of chilliness and other irritations of the nervous system; and such local affections as arise from the stricture of the excretions of the part, the more immediate seat of the disease. Besides the sense of coldness, the person so attacked is sensible of a degree of fulness about the nose, the eyes, the forehead, and the fauces, with more or less of dryness about those parts; this check to their secretions is also frequently attended with an unusual propensity to sneeze, and the voice too becomes changed in its tone, exhibiting a degree of roughness or hoarseness. With these symptoms there is also a slight irritation about the throat and trachea, and more or less cough, but which is dry, and in the commencement attended with very little pain or soreness. The eyes also manifest the irritation; their secretions are restrained, and there is a sense of stiffness in their movements, and sometimes the vessels of the adnata very early exhibit a degree of turgescence resembling inflammation, and in a short time the whole arterial system becomes affected with all the symptoms of continued fever—but the character of this fever will be varied according to the cause producing it; whether it proceeds from cold or from contagion, and which are its two great sources. When the disease proceeds from cold, as wet feet or sudden changes in the atmosphere, the person coming from a warm room into the cold external air, or from change of clothing, cold bathing when the body has been previously heated; in that case the symptoms will be those of the synochal form of fever, the frequent pulse, the white tongue, and diminished excretions generally, a disturbed state of the natural as well as the vital functions, and all other symptoms of the phlegmasiæ in general; and with these, the irritations of the parts more immediately affected are all, in proportion to the general action of the system, sensibly increased in violence; the cough becomes more frequent and severe, pain of the head is also increased, the muscles of the head, the neck, the chest, the back, and the limbs, also are more or less affected with pain, especially upon motion, not unlike the irritations from rheumatism. The secretions from the mucous membranes are also now increased, but instead of the mild bland discharges ordinarily poured out in health, they are acrid and excoriating to all the surfaces over which they flow;

the eyes, the cheeks, the nose, the upper lip, the pharynx, the glottis, are all scalded and sore from the sharp defluxion that attends this stage of the disease.

But the stricture being taken off from the different excretory vessels, the fever abated, and the disease yielding, these discharges from the membranes, the more immediate seat of inflammation are also changed; they become more purulent, and the tone of the system being afterwards restored, they return to their natural character, both in quality and quantity. But when the disease proceeds from contagion, the character of the complaint, both general and local, is sensibly different from the pure unmixed inflammation arising from cold. Even in its attack when from contagion the nervous system is more violently effected, the chill is more severe; delirium in some cases appears almost in the very commencement of the disease. The eyes are more excited, and sensible to light, the adnata more loaded, as in the yellow fever, plague, &c., the pains more acute; pregnant women are disposed to miscarry and flooding is sometimes fatal. (Good, vol. ii. p. 438.) The whole sufferings of the patient are more severe; yet, at the same time the arterial system appears to be less violently affected, the pulse is less full and frequent, and oftentimes shows manifest depression very early in the disease; the tongue, too, as in other contagious diseases, is frequently moist—instead of the white and furred tongue of inflammatory catarrh. This I recollect was remarkably the case in the influenza of 1790—1; and the same was observed in the disease as it appeared a few years since. See Dr. Rush's remarks on the influenza. The Doctor was then full of contagion, with a regard to a great number of diseases, not only yellow fever, dysentery, but catarrh and our consumption he considered of this character. In his observations on catarrh, he remarks that other animals did not escape. And there is a peculiar tendency to the typhoid form of fever. There appears to be a peculiar poison operating upon the system in the case of contagious catarrh, added to the suppressed excretions; and it is remarked, too, that the excretions from the affected surfaces are more acrid in the influenza than in common cold. It is attended too, with greater depression of all the vital powers, especially too, if the system be debilitated by the usual treatment pursued in simple inflammatory catarrh—the exhaustion in that case is frequently very sudden and very alarming. In the treatment of the

two forms of catarrh, the same distinctions must be observed. In the treatment of inflammatory catarrh, occasioned by cold, or by the sensible changes of the atmosphere, the whole treatment must be strictly antiphlogistic and active in proportion to the violence of the symptoms. In some cases, when the disease is diffused over the mucous membranes of the parts, eyes, fauces, throat and lungs, and the fever not very violent, it is oftentimes so mild that by confinement to the house, abstinence from customary food and stimuli, with the use of tepid drinks, bathing the feet in warm water, and perhaps some mild aperient medicine, the disease is removed without any thing else being done; but when the febrile symptoms are violent, the secretions all suppressed, general as well as local, the habit of body athletic, more active measures then become necessary. In that case venesection must be employed to take off the general force of the circulation, and the determination to the inflamed parts. Emetics, active cathartics, salts, calomel and jalap, sudorifics, antimonials, crem. tart. and tart. emet. antimony, or sp. mind. with tart. antimony, Dover's powder; warm bathing, general, local, paying due attention to temperature, aided by tepid drinks, especially mucilaginous drinks—barley water and raisins, with lime juice or currant jelly, flax seed and honey, toast water, rice water, common tea—these should be taken frequently, but in small quantities. The steam of warm vinegar and water, or an infusion of hops and vinegar inhaled every two or three hours for one quarter of an hour, from a common teapot, Mudge's inhaler, or from an inverted funnel. Dr. Bard's mode was inclosing a pot inside of curtains drawn around the patient. But these means are seldom called for where plentiful evacuations have been made from the blood vessels. It is a feeble and inert practice that has led to these expedients. But if the soreness of the throat and chest are more severe, and threaten pulmonary complaints, blisters should be had recourse to, the antimony and calomel continued, antimonial ointment, with an occasional sudorific anodyne, sp. mind. \mathfrak{z} i. laud. gtt. xxx. and through the day, the pectoral mixture as follows, to soothe the cough and irritation of the throat at the same time from its combination with antimony to preserve the relaxation of the surface. The formula is as follows: sugar, spermaceti aa \mathfrak{z} ij.; the yolk of an egg; Golden sulphuret of antimony gr. vi.; or tartarised antimony, gr. ij.; or antimonial wine \mathfrak{z} ij.

with from ℥ij. or ℥iij. to ℥ss. of paregor. elix. or laud. ℥ss. water ℥viiij.; M. coch. mag. every two hours; the paregoric or antimony to be increased or lessened according to circumstances. Caution with regard to laudanum or opium—recollect, as Dr. Badham happily expresses it (p. 109), that if there were no other objection to opium, “it interposes a veil between the disease and the observer, and obscures the symptoms.” But in the first stage there are certainly other objections; but after evacuations have been made, and the irritation is kept up by the sensibility of parts and the acrid secretions, opiates are especially beneficial. When the irritation is not very great, the following mucilaginous mixture may be administered, with the same intention, viz: mucilag gum. arabic, ℥ij.; tart. emet. gr. ij.; oxym. scill ℥i.; elix. paregor. ℥iij., M. Another pleasant combination, R. sacch. chrystal. vel syrup glycirr. ℥i.; gum arabic ℥ss.; vit. antim. ℥ss.; elix. paregor. ℥i.; aq. font ℥j. coch. mag. every two hours. Another favourite prescription of Dr. Badham, is gr. iij. dried squills in powder; gr. i. calomel; gr. i. of digitalis, M. to be taken every night at bed time. (Badham, p. 107) The diet should strictly correspond with this antiphlogistic treatment—all stimulating food should be laid aside. Regimen should be strict, and temperature of the room should be about 65°.

But in contagious catarrh, the influenza, due regard must be had to the peculiar character of the disease, its typhoid tendency, its greater violence as it regards the vital powers, the debility that ensues, the inaction or loaded state of the lungs, the serous effusion in the chest, &c. Be cautious in the use of the lancet. It was tried copiously in the influenza of 1782, but with unfavourable results; also in 1790, or 1791. Be cautious also in the use of violent cathartics, otherwise you prostrate the powers of the system, which are peculiarly depressed by the poison of the disease. Emetics may be used in the forming stage with great advantage, as they of all other febrifuges, unlock the excretions. These are all important in the treatment of the disease when excited by a foreign material introduced into the system; for the same reason expectorants, sudorifics are also indicated, and early, both for the purpose of diminishing febrile excitement in general, and to divert the peculiar irritation of the disease from affecting those organs upon which it is otherwise disposed to act with violence, whether the membranes be the original seat of

the disease, or the vital organs of the system. Dover's powder is peculiarly useful; there is no disease in which it has been found more useful; without it the cough continues obstinate, and aggravates the inflammation attendant upon these affections. When the powers of the system are sensibly impaired, or the typhoid tendency begins to appear, make liberal use of the more stimulating drinks, such as at the same time that they keep the excretions open preserve the general strength, as Virginia snake-root, the Seneka snake-root, wine whey, vinegar whey, &c. Suitable diet too should be directed with the view to support the strength of the patient; and in such typhoid tendency vegetable nourishments, with wine, are to be preferred. Blisters, I may remark, in this stage and form of the disease, should be cautiously applied, and should be early removed, after their stimulating effects for the removal of local symptoms have been obtained.

Such are the remarks which occur to me with regard to the treatment of catarrh in these two different forms. But there is another stage of common catarrh yet to be noticed; I mean its passive stage. Thus far our observations have been confined to the treatment of the inflammatory, or first stage of catarrh. I told you that when catarrh affects the head it may leave an ozena behind it; a soreness of the nares, and perhaps involving the membrane, and possibly the bones themselves in the neighbourhood of the ethmoid bone and the frontal sinuses, attended with a purulent discharge; and such local disease, if neglected, may last for months, to the great annoyance of the patient and his friends. How is this discharge to be restrained? If a mere laxity of the vessels remain, or, in case of ulceration, what are the means to be employed to arrest its progress and to effect a cure? Treat as you would any other relaxed or ulcerated surface, this passive state, by stimulant applications; let the patient snuff up into his nostrils, three or four times a day, a small quantity of common rum, or rum mixed with a proportion of the tincture of myrrh, or eau de cologne, or bay-water, or the spirits of lavender, and let the nares internally and externally be freely washed with the same; a solution of white vitriol may also be applied in the same manner, or yeast, if the parts are very offensive, may be made use of. But it more frequently occurs that after a common catarrh, if it has fallen upon the bronchiæ, or surface of the

lungs, and especially if the chest be weak, a tendency exists to pulmonary complaints, or the patient be far advanced in life, that the relaxation of the excreting vessels remains. The vessels do not recover their natural diameters and they are attended with great increase of their natural sensibility, as well as increased discharge; and with such discharge, which oftentimes appears of a purulent character, the whole system daily loses strength. The patient is considered as exhibiting the symptoms of confirmed pulmonary consumption; and such too it will prove if not immediately arrested. How is this form of the disease to be arrested or removed? In this state of things, when you have ascertained by attention to the circulation, state of the tongue, skin, respiration, degree of pain on respiration, absence of hectic exacerbations, that all local inflammation has been removed, and nothing but laxity of the vessels remains, with general debility, and perhaps slight attack of fever at night, followed by night sweats—the indication is to give tone to the system; thereby both evils, the increased sensibility of the lungs, and the increased discharge from the excretories, are removed at the same time.

To fulfil this indication, immediately remove your patient from the warm air, and the confined apartment in which he has been shut up; for warm air to the relaxed lungs, like a warm poultice to an ulcer when inflammation is removed, continues the discharge, and renders it a perpetual issue. Gradually, then, let your patient be taken out into the external air; and especially combine the benefits of exercise with it—at first in a carriage, but as soon as possible, the more stimulating exercise of riding on horseback. In this form of consumption, Sydenham may indeed say it will as assuredly effect a cure as bark will remove an intermittent. Not so, I assert, when ulcerations and destruction of the lungs have taken place, though in some few instances they also have been healed. If possible, too, as in the treatment of hooping cough, let your patient be removed from the land to the sea air—a voyage, too, will also, in such case, frequently prove beneficial. Bitters—the bitter infusion; chamomile, anthemis nobilis—(but there may be abuse of it in the first as well as the last stage—if useful as a tonic, surely it is prejudicial when there is too much excitement already existing, as in the inflammatory stage)—horehound, marubium vulgare; boneset, eupator. perfol; lichen islandicus, should also be combined. The mineral acids,

gtt. xv. to gtt. xxx. three times a day. The emplastrum calidum. Stimulating expectorants. Lac ammoniac—how made: take of the gum ʒij., aq. frigid, ʒviiij., elix. paregor. ʒiij.

Diet.—Animal food; milk; eggs, soft boiled, raw; oysters, roasted; onions; garlic; mustard; mangos; porter; table-beer; ale; wine; should be made moderate use of. You cannot be too cautious, lest inflammatory symptoms be present. In that case, you easily detect it by an aggravation of all the symptoms.

Regimen.—To sleep moderately covered; temperature of the room; flannel next the skin, to prevent a renewal of the inflammation.

CATARRHUS SENILIS.

There is another form of catarrh, to which I request your attention. I mean the catarrh of old age, and hence very properly denominated catarrhus senilis. But before I enter upon this subject, allow me to make some preliminary observations upon the remarkable changes which the human constitution undergoes at different periods of life, and which are recognised by physiologists and physicians under the appellation of climacterics. Secondly, some introductory observations on old age, and that disease of advanced life called climacteric disease; or as denominated by Sir Henry Hallford, in the Med. Trans. “marasmus climactericus,” called marasmus in reference to the waste of flesh, and diminution of bulk and strength, without any manifest cause.

The human constitution undergoes, at different periods of life, various and remarkable changes, which are recognised by physiologists under the appellation of climacterics. These remarkable epochs the Greeks considered five in number, and from the regular gradation which they exhibit in the human system, they thence denominated them climacterics, deriving the term from the term *κλιμαξ*, signifying gradation. They considered the seventh year as the first climacteric; the twenty-first the second; the forty-ninth the third; the sixty-third the fourth; and eighty-one the fifth. You perceive they are regulated by the multiplication of the figures 3, 7, 9 into each other, and are afterwards equalled by the multiplication of the figures 3, 7, 9, into each other.—Three times $7 = 21$; seven times $7 = 49$; seven times $9 = 63$; nine times $9 = 81$. The two last they denominated

the grand climacterics, being those in which the life of man was supposed to have consummated itself, and beyond which nothing was to be done but to make preparation for the grave. In some instances, the changes referred to have been productive of favourable issue to the system; but for the most part, they are in themselves morbid, or are introductory to the formation of diseases. This is so frequently the case, that Sir Henry Hallford has accordingly considered them as constituting disease, which he hence calls *marasmus climactericus*. The same appellation has been adopted by that learned nosologist, Dr. John Mason Good. (See vol. ii. p. 721.) It is true, that in advanced life, even after those periods denominated the grand climacterics have arrived, wonderful and salutary changes have taken place; a most extraordinary invigoration of the powers of the body and mind has occasionally shown itself. Persons who had lost the sense of hearing twenty years, have been known suddenly to recover it. Others have, as unexpectedly, recovered their lost vision, and were afterwards enabled to see accurately without the aid of glasses. Others, under this new impulse given to the constitution, have undergone a second dentition, and have recovered even new and entire sets of teeth, and in the place, too, of those that had been gradually lost through life. And, according to Forestus, the hair has known a similar regeneration. This last fact is less surprising, as we know the hair possesses the properties of a vegetable, as well as an animal nature, to grow, and change colour even after death.

But at this advanced period of life, we more commonly see changes less favourable, and which prove injurious and destructive of the powers of the constitution. At this time the strength, the spirits, the appetite, digestion, the passions, sleep, and indeed most of the functions of body and mind usually manifest declension. In women it is remarked by some writers that these changes are of less frequent occurrence and less manifest than in men. So says Sir Henry Hallford, who ascribes the fact to the greater exposure of men than women. This I believe, is not the true cause; another explanation occurs to me as much more satisfactory, viz: that the accumulation of blood in the female habit, by the cessation of the menses and the consequent excitement which it imparts to the system, renders women less likely to experience this sudden expenditure of the powers of life. The exposure, however, of men to a check of the functions of the surface

of the body and their less temperate habits, I believe have considerable agency in the production of the diseases of old age. Among the more prominent of this class of diseases is the one now under consideration. The catarrh of old age, or *catarrhus senilis*.

HISTORY OF THE DISEASE.

1st. With regard to the history of this disease, I remark first, that it is more especially peculiar to advanced life, and for the most part, makes its first appearance without any apparent exciting cause.

2d. It occurs with most violence in those of the nervous temperament; and where such sensibility exists in a remarkable degree, it also appears at a much earlier period of life than in those of a different temperament.

3d. It appears also with most violence and comes on earlier in those of a feeble, delicate constitution, whether naturally so, or induced by great mental exertion, by bodily labour, by intemperance, or by disease. The intemperate, if not cut off by more acute diseases, are sure, like Lord Ogilvie, in the play, to manifest this evidence of debauchery and premature old age. Recollect while the old gentleman was boasting of his vigour, he was interrupted by what he called his damned cough; this exposes him upon all occasions.

4th. It attacks those with most severity, who are predisposed to pulmonary complaints, or who have an irritable state of the lungs from previous attacks of disease in those organs, such as hemoptysis, catarrh, pleurisy, peripneumony, &c., induced by this predisposition, the consequence of an attack of hemoptoe in early life. It appeared early in the case of Dr. Rush. In his letters written many years before his death, he speaks of his *catarrhus senilis* as the only exception to his enjoyment of perfect health.

5th. Debauchery also early induces this irritable state of the lungs. A very remarkable instance of this local affection of the chest occurred a few years since in a gentleman of the city of New York—a sedentary life, chiefly spent at the card table, with loss of sleep, followed by an impaired state of the digestive organs produced this disease in the gentleman referred to, in a very remarkable degree, and at a much earlier period of

life than otherwise would have been expected. Again, it is to be observed that there are circumstances which in a peculiar manner prevent the occurrence of this disease. Those of a sanguine temperament, of an athletic frame of body, a well formed chest, whose occupations or pursuits have led them to great exertion in the open air, are frequently exempt from this evidence of age until they have arrived at a very advanced period of life. 2d. The inhabitants of a warm climate are usually exempt from this attendant upon old age. 3d. In like manner those who are in the habit of using the warm bath, usually escape these irritations of the chest to a very advanced period of life. We see this exemplified in a remarkable manner, in the south of Europe, particularly among the French and Italians, and among the nations of the east.

A Frenchman, accordingly, who is a sort of amphibious animal, half his time in a warm bath, is toujours gai, toujours garçon keeps his vigour to the last, burns his candle to the very socket.

The first symptoms of catarrhus senilis show themselves at the approach of cold weather; and to the change of seasons the disease is usually ascribed as the exciting cause, being considered as the commencement of an ordinary catarrh to which it certainly bears great resemblance; doubtless the cool weather of autumn has its agency, for in summer the disease undergoes a manifest remission. The disease also becomes first apparent in the morning, when the cough is the most troublesome and dry, the expectoration being obtained with great difficulty. The cough comes on also in paroxysms which continue many minutes, somewhat similar to the reiterated efforts in whooping-cough; at length, with great difficulty, an expectoration follows of an adhesive sharp phlegm; more or less of a similar acrid rheum takes place at the same time, from the nose and eyes, followed by a soreness which is apt to become a permanent and troublesome symptom. Probably sore eyes are so frequently associated with old age, as connected with and proceeding from a morbid state of the excretions, except where great vigour appears in the system. The skin, too, becomes remarkably dry, and to a degree shrivelled and covered with dry scurf or dandriff.

The excretion from the bronchiæ and lungs is gradually increased by the irritation and frequent returns of the cough; and as the body becomes enfeebled the phlegm accumulates in the

cellular part of the lungs, so as in some degree to impede the due circulation of the blood through the pulmonary vessels, and thereby to interrupt the perfect decarbonization of that fluid, analogous to the impeded circulation through the lungs, in the advanced or passive stage of peripneumony. In this manner, too, death very unexpectedly takes place, and in feeble old age, without a struggle, the interchange between the blood and the atmosphere being suddenly cut off by the interposing mass of phlegm that is accumulated. Under ordinary circumstances, a slight degree of febrile action, the attendant upon this complaint, the cheek exhibits more or less of a hectic flush; and in some cases a livid purple appearance of the face shows itself, with a correspondent quantity of circulation, and heat of the surface, especially in the palms of the hands. An accumulation of blood sometimes takes place upon the brain, producing great heat, and sense of burning. At other times there is giddiness, and sometimes coma or propensity to sleep. Captain G—d frequently complained of a sense of burning upon the top of the head, attended with vertigo, both of which were increased during the paroxysms of coughing, and indeed were probably created by his frequent fits of coughing. The chest also, shows more or less of oppression—sometimes exhibiting an asthmatic fulness. In one instance, this appeared to be the predominant symptom. The heart, too, occasionally partakes of the irritation—it becomes irregular in its action, owing to the interruption in the pulmonary circulation. When these irritations of the brain, and whole system appear, there is also more or less disturbance of the digestive organs, especially loss of appetite, cardialgia, and flatulence; and, vice versa, these latter symptoms are occasionally the means of inducing the catarrhal affection, and the consequent irritations of the brain that have been mentioned.

But whence proceeds the disease? The remote causes have been already enumerated in the history of the disease; viz. a debilitated habit of body, whether constitutional or acquired; the nervous temperament; a variable climate; debauchery and disease. When this catarrh appears early in life, it is generally remarked to appear as a consequence of most of the predisposing and exciting causes making up the foregoing enumeration.

We are now led to ask the more important question, What is the proximate cause of catarrhus senilis? For upon the solution

of this question depends the principle upon which the physician is to proceed in palliating or removing the disease. I have never met with a satisfactory reply to this question, or a solution of the symptoms which have been enumerated. When we keep in view the facts that have been related, as it regards the subjects of the disease; the causes which induce it; the season of the year at which it commences; the variable climate in which it is of most frequent occurrence, we are prepared to believe that the proximate cause, in part, exists in a general debility of the whole system; and an increased sensibility of the lungs, in common with that of the other parts of the body, the effect of such relaxation. The result of the debility thus induced, is that the determination to the surface of the body is thereby lessened; less blood flows to the surface; an accumulation of the fluids in the head and chest is the consequence. An increased fulness, therefore, of the heart and larger vessels will necessarily affect the head and lungs, both of which manifest the irritations which are attendant upon *catarrhus senilis*. Are not the dryness of the skin, as well as the heat and other febrile symptoms, generally met with in this state of body, thus in part accounted for? The consequence of such determination is necessarily an increased excretion from the bronchial, and from the pulmonary vessels, terminating upon the surface of the lungs. I now speak of the quantity of fluids, and those operating as such mechanically.

But there is another source of this peculiar irritation in the lungs, attendant upon advanced age. I refer to the quality of the circulating fluids, as well as their mechanical accumulation, and the consequent increase of the excretions from the head and chest. It is a fact well known to the physiologist, that it is the peculiar province of the skin, as well as the kidneys, to separate from the circulating mass of fluids various saline and earthy materials. Modern chemistry has very clearly made known to us the ingredients which constitute those discharges.* These being retained by the diminished diameter, and the obstruction and destruction of many of the extreme vessels, what follows? I answer, an accumulation of those ingredients in the blood, unless they may be ejected from the constitution by the other outlets;

* See Thompson, Murray, Henry, and others. See Cooper's *Observ.* in the *Portfolio*, Jan. 1818. *Observations on Gout and Stone*, See his last *Introductory Lecture*.

viz. the kidneys, the bowels, and other exhaling surfaces, including the extensive surface of the lungs. Not that there is a direct transportation of the peculiar matter that ought to be thrown off from the skin to the lungs, but an accumulation of it in the whole circulating mass. Thence more of it necessarily shows itself in those discharges passing off by the other excretions, especially where those excretions are most abundant, as the kidneys and bowels; and in old age, the lungs. But do the excretions of the kidneys also manifest this change in the properties of the urine? The reply all concur in, that they do. Hence, then, we are prepared to expect the great irritation of the bladder and kidneys, which is so frequently met with in old age. Hence gravel and stone appear more frequently in advanced life. Hence the acrid urine, and the painful passage of it, especially in the winter season. Hence, too, arise the earthy, or bony deposits, which take place in different parts of the body in advanced life, as in the valves of the heart, in the coronary arteries, and other parts of the body, as in the pineal gland, in the membranes of the brain, and lungs, in the pericardium, &c. (See Baillie's *Morbid Anatomy*.) Hence, too, arises the propensity to eruptive diseases, as erysipelas, pemphigus senilis, (Willan's *Plates*, &c.) and other diseases of the skin, which more or less belong to old age.

But we see an exemplification of this change in the urinary excretion in most persons in the winter season. Every person attending to these changes, and the influence of temperature upon the functions of the kidneys, must have observed the clear pellucid urine that is voided in the summer season, while that of the same person in winter is loaded with earthy and saline materials, doubtless owing to the suppression of the discharge of lithic matter that ordinarily passes through the surface of the body. (See Wilson on *Dyspepsia* and *Gravel*.) I might illustrate the same fact by a case which has fallen under my notice in the New York hospital, where mercury taken to a considerable extent in syphilis became deposited in the cells of the bones, instead of being discharged by the emunctories of the body; this was illustrated by dissection, the bone being still preserved by Dr. Porcher. An analogous case is related in a late English journal. Dr. Coxe observes the same thing occurs in the winter of life, when the function of the skin is to a certain degree suspended, at least impaired, from the obliteration of many of the small vessels of the surface,

and the obstruction of others. The question then presents itself, can the secretions which take place upon the extensive surface of the bronchiæ and lungs be free from those acrid materials which show themselves in the other discharges of the body, and which have no longer their natural outlet? I believe not; the peculiarly acrid quality of the fluids, as well as the inordinate quantity, creates the irritations attendant upon *tussis senilis*.

The indications to be derived from this view of the subject are plain. 1st. To preserve the tone of the whole system, and thereby the secretion by the extreme vessels upon the surface of the body, by which the determination to the chest is diminished; hence appears the importance of exercise, nutritious and stimulating food, especially animal food with the usual condiments of the table, and the moderate use of wine and other stimulating drinks, especially where the person may have been habituated to the use. Wine, therefore, is not merely to be taken as St. Paul recommends it, for the stomach's sake, but for the sake of the whole system; hence, too, the importance of bitters, chalybeates, and other tonics to preserve the healthy action of the digestive organs and of the whole system. A second indication is to preserve open all the other excretions of the system, that the discharge by the surface of the lungs may not be increased; we thence also infer the importance of warm dress; flannel worn next the surface of the body, and that frequently changed, to give it all the excitement which such dress occasions; hence the use of friction by the flesh brush. Dr. Bond, senior, was so sensible of the importance of this excitement of the skin, that he was as regularly curried as his horse, and thereby attained to a very advanced age. Hence the importance of the warm bath, both as an emollient to the surface as well as an excitement of its numerous excretories; for the same reason the bowels should be kept open, and attention paid to the kidneys. Such are the general means of preventing, and indeed of removing the evils attendant upon this disease. A third indication is to preserve the tone of the lungs themselves, and thereby to lessen the morbid sensibility to the causes, the more immediate agents in exciting the disease; but these have already been fully enumerated when speaking of chronic catarrh.

LECTURE XLII.

CYNANCHE TRACHEALIS, OR INFLAMMATION OF THE TRACHEA

THE subject which next falls under our attention, trachitis, is one of great importance: it is a disease of frequent occurrence, violent and rapid in its progress, and if the necessary remedies be neglected, or not early employed, like laryngitis, is generally a fatal disease. Although this complaint has been noticed by ancient as well as by many modern writers, as you will see by consulting the aphorisms of Boerhæve, (pp. 801, 802.) yet it has never been minutely described, or the nature of the disease understood, until within a very few years. Dr. Francis Home, the late professor of the M. Medica in the University of Edinburgh, was the first who investigated the seat and pathology of this disease, and he was also the first who pointed out its proper mode of treatment, or rather the principles upon which the case is to be conducted. Dr. Cullen, in his account of the disease, has nearly transcribed Dr. Home's observations on this subject. But notwithstanding the publication of Dr. Home, physicians generally did not make themselves acquainted with this complaint. When I was in Edinburgh in 1792-3, Dr. Hamilton, though the professor of midwifery and the diseases of children, did not understand its nature, and applied both to Dr. Post and myself, for information on this subject; for in this country it is a disease of much more frequent occurrence than it is in Great Britain. We both stated to him very particularly the inflammatory character of the complaint, and the benefits arising from the antiphlogistic plan of treatment; yet from his late publication, on the diseases of children, it appears that he has still a lesson to learn, for he disapproves of venesection, and the only medicine upon which he relies for the cure is calo-

mel. In like manner, in the late standard work on the diseases of children by Underwood, you find it considered not as an inflammatory disease, but one of a spasmodic nature, and the cure to consist in the use of assafoetida administered in glysters. But a late publication by Dr. Cheyne, contains certainly a very correct practical view of this subject, and constitutes an exception to the general accounts we meet with in British books. Dr. Thomas has made free use of Cheyne, in his chapter on this subject. In France it has been so fatal a disease, and was so little understood, that the late Emperor Buonaparte offered, some years since, a premium of 12,000 francs for the best dissertation on this subject; but although the periodical works since have been inundated with the contents of the various papers which were presented, they most abundantly show the want of correct knowledge, either of the nature of croup, or of its mode of treatment. Even Dr. Albers, of Bremen, who has written a most able paper, and who obtained one of the prizes, does not understand the nature of the disease; and his treatment, consequently, is inert and of little import.

The names under which this disease is described by authors are various. In common language it also receives different appellations: In Ireland it is called *chock*, or stuffing; in England and Scotland, croup; but more usually in this country it receives the name of hives, a corruption of the term heaves, which is probably so called from the heaving or violent efforts of the muscles of the chest and abdomen, which take place in this disease during the process of respiration.

Croup, according to the imperfect and lame definition given of it by Dr. Cullen, in his first lines, consists "in an inflammation of the glottis, larynx, or upper part of the trachea, whether it affects the membranes of these parts or the muscles adjoining." In one particular this definition is defective, as the disease is not confined to the upper portion of the trachea, but also most usually extends itself throughout the whole of the windpipe, even into the bronchiæ, and to a degree over the whole surface of the lungs. The effusion of the lymph, or other materials, constituting the membrane, which is the effect of this disease, also very frequently extends into the bronchiæ, though of a less firm texture than that part of it which is found in the upper portion of the trachea. Some preparations in the anatomical museum of Columbia college show this fact. Dr. John Augustine Smith, the late professor of

anatomy and surgery in this university, informed me, that in a case of croup met with by him, in which he was called upon to examine the parts after death, he observed the membrane to extend as far as the bronchiæ could be traced by the knife.

Conversing also on this subject with the late Dr. Bard, the late president of the college of physicians and surgeons of this city, and who had probably been more conversant with this disease than most practitioners, he informed me that he had commonly observed in those cases which he had examined after death, that the membrane extended into the bronchiæ as well as the trachea.

Dr. Bard also remarks, that the disease is not even limited to the trachea and bronchiæ, but that the lungs, throughout their whole substance, to a certain degree participate in the affection; insomuch that he has seen those organs rendered so dense and solid, that they exhibited in their appearance a great resemblance to the firm and dense structure of the liver, instead of the spongy, loose texture which the lungs naturally present.

The appearances upon dissection, related by Dr. Cheyne in the last edition of his valuable work on this subject, correspond with the observations made by Dr. Bard: "When the child dies after an illness of four or five days, there is found lining the windpipe a white substance, sometimes of considerable tenacity, varying in thickness, and somewhat in density. It arises at, or a little below the larynx, and is prolonged into the divisions of the trachea; and generally a quantity of a white fluid like purulent matter, with which they are filled, is seen working up from the lungs. The inner coat of the windpipe, to which the membrane is attached, is inflamed. Generally the inflammation is also discernible along the whole course of the membrane of the bronchiæ. A serous fluid appears to fill the cells of the interstitial substance. The lungs have a solid feel, from the interstitial effusion, the fullness of the blood-vessels, and the puriform fluid in the bronchial tubes. There is little or no recession of the lungs when the thorax is opened. There are sometimes evident marks of increased vascularity in the pleura pulmonalis. There is serous effusion in the cavity of the thorax and in the pericardium. The cavities of the heart are in general unusually full of blood."

Dr. Cullen very properly observes, that croup may arise, "first in these parts, and continue to subsist in them alone, or it may come to affect these parts from the cynanche tonsillaris or malig-

na spreading into them." This observation was long since made by Dr. Cullen, and has been abundantly established by the cases and dissections published by Dr. Bard, whose treatise is referred to in the nosology of Dr. Cullen, under the head of *cynanche maligna*. (See an Inquiry into the nature, cause, and cure of the *Angina Suffocativa*, or Sore-throat Distemper: by Samuel Bard, M. D. Professor of Medicine in King's College, New York. New York, 8vo. 1771. See also *American Philosophical Transactions*, vol. 1. p. 388.) Other writers, however, do not appear to have paid sufficient attention to this distinction.

Some years since I was called in consultation to a case similar to those described in the valuable treatise of Dr. Bard. The disease began with an inflammation of the tonsils, but was soon succeeded by ulceration, attended with foetid breath and a foul appearance of the parts affected. About the third day the inflammation extended into the trachea, producing the laborious respiration, and hoarse, hollow-sounding cough which characterize idiopathic croup; in twenty-four hours it proved fatal. The attending physician informed me, that during the first three days the child had not manifested any symptoms denoting croup; but, as in the cases recorded by Dr. Bard, they were probably induced by the inflammation and subsequent acrid secretion extending from the tonsils into the trachea. Since that time I have met with several instances of a similar nature succeeding to malignant sore-throat. Other practitioners in this city, who have had frequent opportunities of seeing croup, confirm the observation that this termination of *cynanche maligna* is not an unfrequent occurrence. Dr. Bard informs me that since the publication of his Essay, in 1771, he has frequently observed this disease as the sequela of *cynanche maligna*. Two cases of croup supervening as an accessory disease in ulcerated sore-throat are also related by Dr. Ferriar in his valuable paper on that subject. "Though there were large ulcerations in the tonsils," he observes, "there was nothing uncommon in the symptoms till the inflammation extended to the trachea, when faint, shrill coughing, hissing respiration, and restlessness came on, which were soon followed by death." (See *Med. Hist. and Reflec.* vol. 3. p. 205.) Croup also, in some instances, is the attendant upon scarlatina. A case of this kind occurred in a child of Mr. Peter P. Goelet, of this city; in that case ulcers of the tonsils, which were attended with

considerable inflammation, and an acrid offensive discharge, preceded the symptoms of croup: but by the use of emetic medicine the patient was relieved of these alarming symptoms, and by the use of bark and yeast, which were afterwards administered, both internally and as a gargle, completely restored. In Mr. Cheyne's treatise before referred to, a case of scarlet fever is recorded which proved fatal, in which the membrane was actually formed as in croup, and was removed after death by Dr. Rollo, surgeon of the Woolwich hospital. (See Cheyne, p. 37.)

In some instances, especially where ulcerations take place in the larynx, croup also succeeds to measles. (See Cheyne, p. 39.) In a case related by Dr. Cheyne, it also succeeded to the secondary fever of small pox; and by Dr. Underwood it has been known as the attendant upon the putrid thrush. (See Diseases of Children, 4th edit. vol. 1. p. 333.) Croup also, says Dr. Cheyne, very often supersedes a common catarrhal affection. In a singular instance, Dr. Ferriar also observes, that he has seen pneumonic inflammation converted into a croup on the tenth day of the disease. (Med. Hist. and Reflec. vol. 3. p. 205.) Dr. Rush remarks, "I have seen it accompany as well as succeed the small pox, measles, scarlet fever, and aphthous sore-throat. In the late Dr. Foulke it succeeded acute rheumatism. The late Dr. Sayre informed me he had seen it occur in a case of yellow fever in the year 1798." (Med. Inq. and Obs. vol. 2. p. 376. 3d edit.)

With these facts before us, therefore, there appears to be just ground for dividing this disease into two species: viz. idiopathic and symptomatic croup: idiopathic where the disease is primarily and exclusively seated in the trachea, bronchiæ and surface of the lungs; symptomatic, where it is the consequence of other previous diseases.

It is asserted by some writers, but denied by others, that cynanche trachealis is an infectious disease.

As the cynanche maligna and scarlatina are communicated by contagion or infection, doubtless they may also be so in their consequences; and in this way croup may be transferred by those diseases as the vehicle of communication. The cases related by Von Rosenstein, (see Von Rosenstein on the Diseases of Children, translated by Sparmann,) in evidence of the infectious nature of croup, were probably cases of cynanche maligna, similiar to those described by Dr. Bard. We hence see the propriety of Dr.

Cheyne's observation, that "when a physician has to visit more children than one, with a croupy affection, in a family or neighbourhood, he ought carefully to examine the state of the fauces." (Von Rosenstein on the Diseases of Children, p. 19.) But that idiopathic cynanche trachealis is infectious, I believe there can be no ground for supposing. I should as readily believe that an inflammation of the brain or of the pleura should be thus communicated, as an inflammation of the membrane lining the trachea; and I believe it may be safely asserted that the fact is otherwise. In the numerous families in which I have prescribed for this disease, I have never known it to be thus communicated, either to the attendants upon the sick, or to other children, even though sleeping in the same room, and frequently in the same bed; but I have more than once been called in the same night to two children of the same family, both having been exposed to the same cause, and especially where there is a great predisposition to attacks of this disease, as is the case in particular families.

It also happens that when a child has suffered one attack of croup, it becomes liable afterwards to repeated returns of the same complaint, and that too upon the application of much slighter causes than had induced the first invasion. The same observation is made of pleurisy, sore-throat, rheumatism, and most inflammatory complaints. I am credibly informed of a lady who has suffered twenty-one attacks of pleurisy. How much more susceptible of impressions is the sensible membrane lining the trachea, especially during infancy? But happily as this sensibility diminishes by age, the returns of the disease become less frequent, and when children arrive at the tenth year, it is comparatively of rare occurrence.

I have never visited a child upward of twelve years of age in this complaint, except where it had suffered previous attacks of it; yet in some instances, as before remarked, adults are the subjects of this disease. In the winter of 1809, I was called to a lady who had lately removed to this city from the state of Virginia. She went to bed in perfect health; she was awakened by coughing, attended with pain, and a sense of burning in her throat. These symptoms were soon followed by difficult, hoarse, and laboured respiration; her husband became very much alarmed, and called upon me between twelve and one o'clock; I found her in great distress, coughing almost incessantly, every inspira-

tion being attended with the peculiar noise of croup. Her cough was dry, accompanied with the usual deep hollow sound, that characterizes this disease in infancy. I immediately bled her freely from the arm, gave her an antimonial emetic, and applied a blister to the throat. I also left directions, that if the difficulty of breathing should continue, to take a dose of calomel and James's powder, composed of five grains each, every two hours, and to dilute freely with warm toast-water, herb-tea, or barley-water, which are the drinks I usually direct in this disease. By these means she was relieved in a few hours. I was also in like manner called upon about three years ago to another lady attacked in a very similar manner, and who was relieved by the same means that have been enumerated in the former case.

During the year in which I resided in Virginia, in 1790—1, I visited, with Dr. Dick, in the neighbourhood of Alexandria, a man dying with every symptom characteristic of this disease. Dr. Mitchill, the learned professor of natural history in this university, suffered a severe attack of croup in the spring of 1801, during his attendance at Washington as a member of Congress. But there is an instance of this disease attacking the adult, which can never be forgotten, as it deprived our country and the world of one of their most illustrious citizens, George Washington, late President of the United States.

Most writers have followed Dr. Home, in representing the disease as more particularly confined to maritime situations; but it is now well ascertained, that although croup is of most frequent occurrence on the sea coast, where the air is loaded with moisture, and the changes of weather are most sensibly experienced, that it is still oftentimes met with in the interior of the country. The publications of Dr. Rush and Dr. Currie,* of Philadelphia, Dr. Stearns, of the county of Albany, in the state of New York, and Dr. Archer, of Maryland, afford evidence of this fact, for they have described the disease as it appears in places very distant from the sea. Dr. Cullen observes, that it is met with in inland countries as well as on the coast. Most usually it is

* Currie's View of the Diseases most prevalent in the United States of America, at different seasons of the year, with an account of the most approved method of treating them, &c.

ascribed to cold as its exciting cause. It is true, it is frequently produced during the severe cold of winter; but as far as I have noted its occurrence, it appears most frequently upon the approach of winter, and in the spring. I have also observed, that during severe blowing and stormy weather the cases of it are most numerous. During the summer season it is also produced by the same cause. I have frequently traced an attack of croup to the imprudent exposure of a child to the night air after a hot day, or to a stream of air to which it had been exposed in a hall or window.

This disease is described by Dr. Cullen, and by most practical writers, as consisting in an inflammation of the secreting membrane lining the trachea. But Dr. Millar, (Millar on Asthma and Hooping-cough,) Dr. Underwood, Mr. Field, (Edinburgh Practice of Physic, vol. i. p. 355,) and Dr. Archer, of Maryland, describe two species of croup; one *inflammatory*, another, which they denominate *spasmodic* croup. This disease is of very frequent occurrence in this city; yet, although I have been a practitioner of medicine since 1794, and in that time have prescribed for many patients in this disease, I have never met with a single instance in which it assumed the spasmodic character described by those gentlemen, that is, unaccompanied by symptoms of local inflammation.

Dr. Bard, whose practice has been more extensive than that of any other physician of this city, informs me, that from the year 1762 to the present time, he has never met with a case of croup that was not attended with symptoms of inflammation. Dr. Scott, of New Brunswick, who has practised medicine with great reputation in the state of New Jersey, more than fifty years, makes a similar observation. It is true that this disease attacks the patient very suddenly, and that in its commencement the affection of the throat is frequently without pain, and is attended with very little fever, even during the first two or three hours after the attack; while the cough, peculiar noise, and labour of respiration which characterize croup, are very considerable, and to the friends, acquainted with the nature of the disease, and apprised of its dangerous consequences, very alarming. Most usually, however, in those cases in which the child is old enough to express its sensations, there is a sense of pricking, burning, or irritation in the windpipe, sufficient to denote the seat of the disease; and such is

the sensibility of the windpipe to the impressions made upon that delicate organ, that the local affection, as in the first attack of pleurisy, is out of all proportion to the general febrile excitement of the system; for neither the pulse or heat of skin are much affected during the first two or three hours of the disease. These facts, and the sudden relief which the patient sometimes obtains from the means prescribed during the first stage of the complaint, have, perhaps, led the authors mentioned, to consider croup as, in some cases, a spasmodic disease of the windpipe; sometimes, too, especially when occurring in a delicate habit of body, the use of the common domestic remedies, viz: warm bathing and warm drinks, are sufficient, by the relaxation they induce in the system to restore the suppressed excretions, and thereby to remove the irritation from the part affected. But notwithstanding this happy termination, it does not follow that the disease is only spasmodic, and not inflammatory; for we frequently see catarrh, and sometimes even incipient pleurisy, by all acknowledged to be diseases exclusively of an inflammatory nature, removed without having recourse to the more active remedies usually resorted to; but unhappily this disease generally attacks children of the most robust habit of body, and if not immediately arrested, terminates in violent inflammation, accompanied with fever, which are only to be removed by the most prompt and decisive practice. In cases of this sort, to trust to the prescriptions ordinarily directed for the removal of the most violent spasmodic affections, is to do nothing; it is worse than nothing; for while the physician temporises, the child perishes. Many lives, I believe with Dr. Ferriar, "have been sacrificed to the imaginary powers of assafoetida, or small repeated doses of antimonials, from unfounded theories of spasmodic constriction attending the disease." (Med. Hist. and Reflec. vol. iii. p. 210.)

Dr. Cullen observes, that the antiphlogistic regimen is necessary in every stage of the disease, and that he has not found antispasmodic medicines of any use. It is, therefore, most safe for us to consider with Dr. Rush, that all the varieties which this disease assumes, "are the effects of a difference only in its force or in its duration," and, to continue to use the language of that accurate clinical observer, that "they all depend upon one remote and one proximate cause." It also fortunately happens, that the

practice which is found most effectual in inflammatory croup, is is not opposed to that which would be indicated if the disease were exclusively spasmodic; on the contrary, the remedies found most useful in counteracting inflammation, are also among the most powerful antispasmodics. This leads me to add some further remarks on the

TREATMENT OF CROUP.

Writers upon this subject differ as widely as they do about the nature or character of the disease; but none, in my opinion, appear to have sufficiently discriminated between the different stages in which the remedies they severally recommend ought to be employed; even Dr. Cheyne's late valuable work, and which contains the best pathology of this disease, is in some degree defective in this respect. I have been led at the bed side to distinguish *three* distinct stages in croup: the first may be denominated the *forming stage* of the disease; in this the affection is local; the irritation has not yet extended to the whole system; the child even sits laughing and playing upon the lap of its mother, manifesting a very unusual but morbid degree of exhilaration; its skin is cool and moist, its pulse not perceptibly accelerated; but its hoarse, hollow sounding, and frequently returning cough, its wheezing inspiration, its restlessness, and especially its cries after a fit of coughing, all denote to the physician and parent acquainted with the disease, the consequences that will soon ensue, if active means be not employed to prevent the *second*, or *febrile stage*. In this stage the whole system partakes of the irritation; the pulse is frequent, the skin hot and dry, the respiration hurried, the tongue covered with the usual white fur indicative of inflammation, the lips and cheeks remarkably florid, the cough frequent, but attended with a more acute sound than that of the first stage; every inspiration too, is attended with more uniform wheezing than that which appears in the first, when occasionally an interval occurs in which the child breathes as if in health. But in this second stage no such interval is perceived; the trachea, bronchiæ and lungs become so surcharged by the circulating fluids, that the child has not even a momentary relief from its oppression; and in a short time, if left to itself, especially if the

patient be plethoric, the countenance exhibits a purple, livid colour, not unlike that of apoplexy, and is even attended with a degree of stupor, or propensity to sleep. This loaded state of the lungs and interruption to the free return of blood from the head I have frequently witnessed in this stage of croup: if the patient be now neglected, or the evacuations be sparing and insufficient, an effusion from the exhalent vessels opening into the windpipe, bronchiæ, and surface of the lungs, inevitably takes place. In the two former, the effused matter assumes a membranous appearance, probably owing to the forcible passing and repassing of the air through those preternaturally constricted tubes; but in the lungs themselves it appears in the form of a viscid fluid, partly resembling both phlegm and pus. When this effusion has actually taken place, the febrile symptoms sensibly abate, and sometimes disappear altogether; the child is also apparently free from pain, but it suffers violent paroxysms of cough and difficult breathing, attended with an irregular and spasmodic respiration, as in asthma, or dropsy of the chest, and with similar intervals of ease. These paroxysms, in young children, continue but a few hours before dissolution. But in children arrived at eight or ten years of age, they frequently continue several days. A daughter of Gen. Morton, whom I saw in consultation, continued to struggle with those painful paroxysms at least four or five days after the febrile stage had terminated, and the effusion of matter, constituting the membrane, was supposed to have taken place. In some cases the impediment to inspiration, and the distress attending the paroxysms are so great, that the only position in which the patient can respire, is with the head thrown back. In this situation the trachea is extended, and thereby its capacity increased, and adapted to the membrane which it encloses. In some instances before death, general convulsions ensue, which speedily terminate the sufferings of the patient. This stage, in which the membranous effusion takes place, I denominate the *membranous*, or *purulent stage*: from this advanced state of the disease recovery is so rare, that it is not to be expected; it might almost be denominated the *fatal* stage of croup. These distinctions it is, in my opinion, important for the practitioner to keep in view, as they lead to important conclusions in practice.

They teach us, during the first or forming stage of this disease, to adopt the most active means of restoring the suppressed secre-

tions of the trachea and surface of the lungs, and by open bowels and perspiration to guard against the general excitement of the system. For this purpose, when called to a patient labouring under the first symptoms, in which the disease appears to be confined to the parts primarily affected, it is my practice to administer an emetic composed of tartarized antimony and ipecacuanha; to a child under two years of age, I direct from one to two grains of the emetic tartar, with from five to ten grains of ipecacuanha every fifteen minutes, until it operates to such a degree, as to induce a plentiful secretion from the trachea and lungs. It is surprising, in some instances in this disease, to see the immense quantity of viscid, ropy phlegm discharged by the operation of an active emetic at this period of the complaint; but when this discharge has been accomplished, and the cough has become loose, which is an evidence of the natural secretion being restored upon the surface of the parts affected, we may, in most cases, consider the patient secure from danger.

It is usual with many physicians, upon these occasions, to administer large quantities of warm water to the patient, under the operation of an emetic: this practice, in my opinion, by washing the medicine out of the stomach, and diluting it, diminishes the nausea and general relaxation which it otherwise produces, and upon which its beneficial effects in a great degree depend. When the emetic has no other effect than to produce vomiting, I immediately direct the bowels to be emptied by the common domestic injection, and a dose of calomel from five to ten grains to be given, unless the child may be completely relieved; for it frequently happens that an emetic alone, by restoring the excretions from the windpipe and lungs, and the other evacuations, by perspiration and stool, which it creates, affords immediate relief, especially if the physician be called early in the disease.

The same result is thus noticed by Dr. Rush, in his excellent practical remarks on cynanche trachealis:

“In the forming state of this disease, which may be easily known by a hoarseness, and a slight degree of stertorous cough, a puke of antimonial wine, tartar emetic, ipecacuanha, or oxymel of squills,* is for the most part an immediate cure. To be effectual,

* As the operation of the squills is very much limited to the stomach, and does not produce the same general relaxing effects upon the whole system that are pro-

it should operate four or five times. Happily, children are seldom injured by a little excess in the operation of this class of medicines. I have prevented the formation of this disease many hundred times, and frequently in my own family, by means of this remedy." (See *Med. Inq. and Obs.* vol. 2. p. 377. 3d edition, 1809. Philad.)

But it too frequently happens, that many of the common family prescriptions are in the first instance employed, and much valuable time lost, before the physician is called upon; in that case, if the febrile symptoms have already manifested themselves, other remedies are indicated. In this second stage of croup, such is the determination of the circulating fluids to the part affected, and such the general febrile excitement of the system, that the most efficient means of diminishing the plethora of the blood vessels, and of diverting the irritation from the part affected, become necessary. With this view, the patient should be bled freely, in proportion to its age and powers of constitution; say, for a child under two years, from two to four ounces; from two to six years, from four to six or eight ounces, and to be repeated as the urgency of the symptoms may require. Most writers recommend the blood to be taken from the jugular veins; as I have never, even in the youngest children, experienced any difficulty in opening a vein upon the back of the hand, and of drawing a sufficient quantity of blood from that part, especially after immersing the hand a short time in warm water, I have never had occasion to open a vein in the neck; and as the child is generally very restless in this disease, and there is on this account more hazard in opening one of the jugular veins than those on the back of the hand, I have uniformly preferred the latter. It is also preferable on other accounts: it is difficult to ascertain the quantity of blood drawn from the jugular; the vein cannot be so readily closed, and the orifice is apt to open afresh by a violent fit of coughing. I confess I read with surprise the observation of Dr. Cheyne, that it is difficult to procure a sufficient quantity of blood from any other than the jugular vein. Dr. Ferriar makes a similar remark, "that in the case of very young children, we must almost despair, for it is extremely difficult to procure any blood from them by the

duced by antimony and ipecacuanha, and having frequently been altogether disappointed in the emetic effects of it, I have totally abandoned the use of this medicine in the first stages of this disease.

lancet." These difficulties I have never experienced; the vein on the back of the hand, even in children six weeks old, being always perceptible to the finger, if not to the eye.

Although I am not an advocate for small bleedings in croup, let me here take occasion to express my disapprobation of the practice of some physicians, especially that recommended by the late Dr. Bayley, of this city, Dr. Ferriar, of Manchester, and Dr. Dick, of Alexandria. (See 3d Supplement to Dr. Barton's Med. and Physical Journal, for May, 1809, p. 242.) I mean that of bleeding the patient until fainting be induced. The relaxing effects of blood-letting upon the system are no doubt desirable in this complaint, and were probably the objects which the advocates of this mode of treatment had in view; but having observed, in some instances, very serious and permanent evils to the constitution, occasioned by the debility which this profuse evacuation had produced, and knowing that even the most violent attacks of croup will yield to a less excessive evacuation by the lancet, when conjoined with other remedies, I have hitherto objected to this practice in the extent it has been recommended. After blood-letting generally some partial relief is immediately obtained; respiration is less frequent; the peculiar noise of inspiration is also diminished; the cough becomes more loose and yielding; the skin is rendered moist, and the pulse less tense and frequent. But these favourable symptoms are oftentimes deceptive, and of short duration: the cough, laboured respiration, and heat of skin, are perhaps all renewed in the course of an hour. In that case the antimonial emetic must be immediately employed. Although the force of the disease may have been greatly subdued by blood-letting, the alarming symptoms so frequently return, that I am now in the constant practice of prescribing the emetic immediately after blood-letting has been performed, without waiting to ascertain the effects which the bleeding alone might produce; if, however, after the operation of the emetic, the symptoms still continue violent, I usually repeat the bleeding, immerse the patient in a warm bath, apply a large blister to the throat, covering the larynx and trachea, and administer a cathartic of calomel, from five to ten grains,* repeating this medicine every two hours, until it

* Such is the efficacy of calomel in the treatment of croup, that some practitioners place their chief dependence upon it in every stage of this disease, even in its most violent forms. Dr. Stearns, of this city, a physician of great reputation, and who

produces some sensible effect in this respect, at the same time soliciting its operation upon the bowels by injections occasionally administered.

These several remedies have been employed, and having failed completely to subdue the febrile symptoms, and to divert the irritation from the trachea and lungs, I next direct small doses of calomel and James' powder, from two to five grains of each, to be given every two hours, to a child under four years of age; but when sufficient evacuation from the bowels may have been procured, I frequently prescribe the antimonial wine, or a solution of tartar emetic, in such doses as to excite a considerable degree of nausea and relaxation; with these I occasionally blend a small portion of laudanum, where it may be indicated either in consequence of the profuse evacuation by the bowels, or when the cough may be very harassing to the patient, which is sometimes the case when the febrile symptoms are greatly moderated; in other respects laudanum should be administered with great caution in this disease.

The physician is sometimes called upon at a late period of the disease, where the means which have been described have not been employed; or if they have been, may not have succeeded, and in which the third stage of the disease has become apparent. Respiration, as in the two preceding stages, is still laborious, accompanied with the same wheezing noise upon every inspiration; the cough also continues violent, without the least expectoration, and returns in paroxysms, in which the patient is threatened with

is said to have been singularly successful in the cure of croup, prescribes it in connection with the cerated glass of antimony, at the same time administering a decoction of the seneka snake-root, (*polygala senega*): for a child of a year old, when the disease has assumed its most alarming symptoms, he directs 20 grs. of calomel with 8 grs. of the cerated glass of antimony; for a child of two years of age, the dose is increased to 25 or 30 grs. of calomel, with a proportionate increase of antimony. This combination, Dr. Stearns observes, generally operates two or three times as an emetic, and as often by stool; but if the disorder continues after the operation of this dose, he gives the decoction of seneka, and at the expiration of every eight hours repeats the dose of the calomel and antimony, until the cure is complete. In common cases he remarks that one dose is sufficient, and that he has never found it necessary to give more than four. Dr. Stearns, considering croup to arise from a torpor in the absorbents of the trachea, and not primarily an inflammatory affection, disapproves of blood-letting, "as a very hazardous remedy, and which ought never to be prescribed in simple cases of croup." (See Coxe's Med. Museum, vol. 5. p. 195.)

immediate suffocation; the countenance exhibits a blueish livid appearance, at the same time that the patient manifests the greatest anxiety and distress; occasionally, however, it has intervals of ease, in which its sufferings are apparently inconsiderable; but these intervals are of short duration, and afford no prospect of relief, for the effusion before mentioned, and the consequent formation of a membranous matter lining the trachea and bronchia, has already taken place. In this stage of the disease, it has occasionally happened that portions of the membrane have been thrown off by coughing, by which the patient has happily been preserved. Two cases of this kind are related by Dr. Home, (p. 53, 54,) which have induced him to hope that "art, though not in the way of internal medicine, may attempt effectuating the same end."

But although nearly fifty years have elapsed since the publication of Dr. Home's treatise, in which this suggestion is contained, we do not learn that in a single well authenticated case the operation of opening the trachea has been successfully performed; and when we recollect what has already been stated, that the disease is not limited to the trachea, that the inflammation and effusion of matter are spread over the greater part of the surface of the lungs, that the membrane itself frequently extends below the division of the trachea, the inference is plain, that even if the membrane alone could be detached, it would still be doubtful how far the disease would be removed by the operation. In one case, related by Dr. Home, "part of the membrane was thrown up, yet the patient died." (p. 53.) But although it were certain that the membrane was confined to the trachea alone, such must be the difficulty of detaching it from its connexion, and such the embarrassments, from the restlessness of the child, the constant movement of the larynx in respiration, the discharge of blood, &c. that must necessarily attend an operation of this sort, that I should be inclined to rest the whole hopes of relief, even in this advanced stage of the disease, upon the use of internal medicines.

Calomel, in small but repeated doses, squills, the syrup of onions, the seneka snake-root, ammoniac, and assafoetida, and the vapour of vinegar and water, are the medicines upon which I am inclined to place most reliance at this advanced period of croup. As they are a class of remedies calculated to excite the secretion from the lungs, without impairing the general powers

of the system, they afford, if steadily persisted in, the best means of loosening and of ejecting the membranous matter, as well as the fluid materials effused over the surface of the lungs.

The following case, related by Dr. Rush, of the good effects of calomel in the advanced stage of croup, should incite us to the diligent use of this remedy, even after the effusion of the matter constituting the membrane has been ascertained to have taken place. The doctor observes, "I once attended a man from Virginia, of the name of Bampffield, who, after an attack of this disease, was much distressed with the stertorous breathing and cough, which belong to it; I suspected both to arise from a membrane formed by inflammation in his trachea. This membrane I supposed to be in part detached from the trachea, from the rattling noise which attended his breathing. He had used many remedies for it to no purpose. I advised a salivation, which in less than three weeks perfectly cured him." (Med. Inq. and Obs. vol. 2. p. 380.)

But these stimulant remedies, excepting calomel, the use of which, in the first stages of croup, has already been noticed, should, in my opinion, be confined to the third stage of this disease. Many families of this city, and some physicians too, are in habits of prescribing the syrup of onions in all stages of croup, without discrimination. So powerful a stimulant cannot certainly be administered with safety where blood-letting and other means of reducing the increased excitement of the system are indicated. Dr. Archer, of Maryland, has rendered an important service to medicine by reviving, not introducing, (see Woodville Drinker's remedy,) into general use the polygala senega, as a remedy in croup. Hitherto, however, it has certainly disappointed the expectations of most practitioners, because, like the old woman's onions, it has been prescribed indiscriminately in every stage of the disease; whereas, for the very reason that it is so useful in exciting the vessels of the trachea and lungs to a powerful excretion of the materials oppressing them in the last stage of croup, it is certainly a hazardous prescription when those organs are preternaturally excited, as they are both in the forming and febrile stages of this disease. Lest you may not have seen Dr. Archer's treatise, I subjoin his formula for preparing and administering this medicine: he observes,

"The decoction of the root is the manner in which I have ge-

nerally seen it used ; the strength must be determined by the physician : it must be so strong, as to act sensibly on his own fauces, in exciting coughing, &c. Half an ounce of the root of seneka, bruised and simmered in a close vessel in half a pint of water, until reduced to four ounces, will probably in most cases be sufficiently strong. A teaspoonful of this to be given every half hour or hour, as the urgency of the symptoms may demand ; and during these intervals a few drops occasionally, to keep up a sensible action of the medicine in the fauces, until it acts as an emetic or cathartic ; then repeated in small quantities, and so frequently, as to keep up a constant stimulus in the mouth and throat." (pp. 33, 34.) "The powder," he adds, "has lately been used in doses of four or five grains, mixed in a little water, with effects equally pleasing as the decoction."

For the same reason that stimulant remedies are thus indicated, blood-letting, emetics, the warm bath, and such other medicines as relax and debilitate the system, and which were indicated during the two first stages, ought in this to be prohibited ; for in this debilitated state of the system they not only diminish the power of secretion, but of ejecting the matter secreted. If circumstances, however, should indicate an emetic in this stage of the disease, and the decoction of seneka should prove insufficient, the sulphate of zinc or copper is certainly preferable to that of antimony or ipecacuanha, the former being less debilitating, while they afford all the advantage which can be obtained from the mechanical operation of vomiting, and which is all that can be desired at this advanced period of the disease ; at this time it is also necessary to sustain the strength of the patient by more nutritious food than is proper in the first stages ; a cup of sago, arrow root, chicken soup, or weak wine whey, are now indicated ; but the latter should be carefully abstained from during the inflammatory stages of this disease, when the patient should be confined to such drinks and nourishment as are least calculated to excite the system. Seeing then, that so little remains to be done in this third stage of croup, we are taught the importance of very active treatment during the first and second stages of this disease.

Candour, however, obliges me to acknowledge, that in the course of my practice I have lost two patients in this complaint : the one in the month of September, 1797, a child of Mr. Nexsen ; the other, in April, 1808, a child of Mr. Herman Hen-

dricks of this city. Generally speaking, I consider croup in its early stage as much under the controul of the remedies which have been enumerated, as a pleurisy or any other inflammatory disease. But as Dr. Ferriar justly remarks, "if the alarming symptoms are not mitigated during the first six hours, the disease will generally prove fatal." (Med. Hist. and Reflec. vol. 3. p. 203.)

LECTURE XLIII.

PERTUSSIS.

PERTUSSIS, or hooping-cough; or, as it is very appropriately denominated by Sauvages, *tussis convulsiva*. The term hooping-cough, by which it is vulgarly known, refers to the convulsive, long inspiration, or hoop which attends the fits of coughing in the advanced stage of the disease. Another name by which it is known, is *chin*, or *kin* cough, derived from the Saxon or German term “*kind*,” a child, referring to the early age of childhood in which the disease most generally occurs. The ancients, from its violence, called it the wild or untameable cough—by the Greeks it was called *bex theria*—by the Romans, *tussis farina*. Dr. Good, with his love of novelty as to the names of diseases, calls it *bex convulsiva*. So little has been known of hooping-cough among either the Greek, Roman, or Arabian writers, that we refer to Dr. Willis, who wrote in 1664, for the first accurate description of the disease. It is contained in his “*Pathologia Cerebri et Nervosi Generis*,” cap. xii. Dr. Willis practised medicine in London, between 1650 and 1680, as a cotemporary of Sydenham—he delivered his views of this disease in the University of Oxford.

But the most ample and complete description of it is said to be that published by Dr. Watt of Glasgow, in 1813, who views the disease as one of inflammation.

Sauvages, judging from his practice, in which he recommends venesection and emetics, also takes this view of its inflammatory character. Huxham, too, advises the same treatment—venesection, an emetic every evening, and a blister to the chest. Dissec-

tions made since, by Sir Astley Cooper, also demonstrate its inflammatory nature. (See Dawson's Nosology.)

This disease, notwithstanding all that has been written upon it, is constantly to be found among the daily outlets of human life. Although the world has had a long acquaintance with this disease, very little appears to have been done in lessening its violence or its malignity. The cause of this, in my opinion, has arisen from the incorrect views that have been taken of the nature and peculiar character or proximate cause of the disease. (Badingfield, p. 288.)

Judging from the place which this disease holds in the systematic arrangement of Dr. Cullen and others, and indeed from the mode of treatment which you find directed by most practical writers, you would suppose whooping-cough to be exclusively a disease of the nervous system. Indeed, as you have already seen, Dr. Cullen places it among his spasmi, which conveys both a very inadequate and incorrect view of this disease, as we shall see by attending to its symptoms, and the means which have been found most successful in the treatment of it.

Dr. Cullen defines it, "*morbus contagiosus; tussis convulsiva strangulans, cum inspiratione sonora iterata; sæpe vomitus;*" i. e. a contagious disease, attended with a convulsive strangling or suffocating cough, which is rapidly repeated or reiterated, with a sonorous inspiration or hoop, and oftentimes with vomiting.

Dr. Cullen should have added, *et initio cum febre synocha*, or at least *febricula*; i. e. that in the commencement, or the first stage, it is attended with a synochal fever, at least in a moderate degree; for doubtless, during the first few days of this disease, a febrile excitement, as in common catarrh, is very manifest. Nothing is more common than for the physician to be sent for in the very commencement of whooping-cough, and to be told that the child has taken a cold. (Children are most affected, but not always. Dr. John Gregory took it from his son James, when six months old.) And only by the continuance of the complaint, and the train of symptoms which supervenes, is it known to be whooping-cough. Indeed, I never did see a case of whooping-cough that was not attended, in its first stage, with more or less of the symptoms denoting synochal and catarrhal fever, attended with a degree of active inflammation, and which are usually ascribed to cold; but which constitute an essential part of the character of

the disease, and should accordingly receive the attention of the physician. Dissection has frequently manifested the effects of inflammation; sometimes in the glottis, larynx, trachea, bronchiæ, lungs; the air cells filled with a purulent matter, which denotes necessarily a preceding inflammation. Serous accumulations sometimes have been found in the pericardium—the effects are not confined here—tuberculated lungs, visceral obstructions, and enlarged maxillary glands, have been found to be the consequence. I have hence been induced to place pertussis among the phlegmasiæ. And let me add, that by treating it as one of this class of diseases, you render it comparatively both a short and a mild disease. With the same view, I divide this complaint into two stages. In the first, or inflammatory stage, you find mostly the symptoms of common catarrh; viz. a dry cough, without any expectoration; or if any, the patient discharges a thin, sharp humour; the tongue furred, attended with thirst; a dull, watery eye; and occasionally, as in some other contagious diseases, with some degree of soreness; head-ache; pain of the chest; and not unfrequently a bleeding from the nose; extravasation of the vessels of the eyes, or even in some cases, hemorrhage from the lungs. At the same time the general symptoms of fever are present, as a dry and hot state of the skin, diminished excretions, and a loss of appetite or quickened circulation. These febrile symptoms are usually slight. In some cases, the disease assumes a much more violent character, and has proved fatal before it has run through the ordinary course; and after death, inflammation of the trachea and lungs, with effusion, have been found. Adhesions of the pleura of the lungs to that lining the ribs has also, in some instances, taken place early in this disease. Generally however they continue during the first fortnight, when they abate, and give place to others, which are of much longer duration. After the inflammatory stage has subsided, the disease frequently continues, not only for weeks, but for several months—six or seven—and perhaps a twelvemonth. When mild, it generally lasts two or three months, when severe, six or seven; and when it has nearly ceased, it has been revived by the slightest exposure to cold. So great is the sensibility which follows the disease when long protracted.

In this second, or passive stage, the vessels of the lungs become relaxed, and the excretion from them very profuse. In this stage, too, the fits of coughing become more tedious, attended

with a spasmodic affection of the lungs, or a painful and long continued inspiration, called hooping, or the back draught, in Scotland. Indeed the spasms in some instances, become so severe that they amount to a general convulsion of the whole frame. In some instances, delirium is produced. This is in part to be accounted for from the increased debility, and consequent sensibility of the whole system, which are both increased by the duration of the disease, even though the original exciting cause be in a great degree expended. Habit continues the fits of coughing. But another reason is to be given for the general irritation and convulsion which attend on the fits of coughing that occur in the advanced stage of the disease. It is that the passage of the blood through the lungs being interrupted by coughing when long continued, the head becomes surcharged, and the brain more or less affected by congestion, in some instances producing convulsions; in others hemorrhage, from the nose or ears, or from the lungs themselves, which has proved fatal; and in some cases it has terminated in hydrocephalus, in an apoplexy, or perhaps in permanent blindness. Five hundred are stated to die annually of this disease, in London—in 1822, seven hundred and fifty-seven deaths are recorded in the bills of mortality, exceeding the deaths by small-pox. Hooping-cough, if not actively treated in the first stage, in some instances ends in a chronic catarrh, in asthma, or where there is the least predisposition to pulmonary complaints, phthisis pulmonalis has been the consequence. Contagion constitutes the exciting cause of this disease. It is however, very much to be aggravated by other causes operating at the same time as cold, exercise, either of mind or body, or improper diet, either as it regards quantity or quality. These additional means of excitement should all be carefully avoided when the system may be under the irritation of this disease.

In the treatment of this complaint, two indications corresponding with the two stages of the disease which we have pointed out, present themselves. 1st. To restore the secretion from the lungs, and the general excretions of the system, which are suspended or interrupted in the first stage of this complaint, and to moderate the excitement of the whole system. 2d. In the second stage, to give tone to the system, and thereby to counteract the

spasm and irritation which arise from the increased sensibility of the lungs and of the system in general.

The remedies for the purpose of accomplishing the first, are, 1st. Venesection, if the inflammatory symptoms be acute, and the patient of a full habit of body. 2d. Purging. 3d. Blisters are in some instances called for. Dr. Robertson, in the January No. (1821) of the Lond. Med. Repository, states that of all the remedies he has ever employed in whooping-cough, frictions on the region of the stomach, with the tartarized antimonial ointment, have been the most undeviatingly useful. 4. Emetics are especially useful in this disease, and should be frequently repeated, at least every other day, until the secretion from the lungs be completely restored; that is, until the expectorations be abundant and easy upon the return of the fits of coughing. In the mean time, too, small nauseating doses of the antimonial solution, or of antimonial wine, will be found useful in removing the febrile symptoms of the first stage of this disease. In this stage of the disease the sudorific anodyne, consisting of a few drops of laud. proportioned to the age of the child, and sp. mind. or antimonial wine may be given occasionally, with great benefit. Another external application of the same character, in whooping-cough, is Struve's Lotion, viz: tartarised antim. $\mathfrak{z}\text{i}$., aq. font $\mathfrak{z}\text{ij}$., tinct. cantharides $\mathfrak{z}\text{j}$. M. (See Paris.) With the same view, the drinks of the patient should be calculated to aid the secretions, and should be given frequently, and moderately warm; he should also breathe a warm air, and frequently bathe the feet in warm water—in a word, all the means that have been recommended in the treatment of common catarrh, should be made use of in this disease until the surfaces are all relaxed, and the secretions restored; for this purpose, too, the diet and regimen of the patient should be of the antiphlogistic kind during the first stage of whooping-cough. Another remedy which has been lately recommended in this stage of whooping-cough, is a combination of laudanum, ipecacuanha wine, and the carbonate of soda; this combination was introduced by Dr. Pearson, and is said to be very efficacious in the first stage of whooping-cough, and is usually prescribed after an emetic has been given—it is composed as follows; \mathcal{R} . tinct. opii. gtt. i.; vin. ipecac. gtt. v.; carbon. sod. gr. ij.; mixed in sweetened water—to be repeated every four hours for several days. As it usually produces more or less confinement of

the bowels, some mild purge, such as magnesia and rhubarb, should occasionally be given. Dr. Pearson states that he was led to the use of this alkaline prescription by the sour smell of the matter discharged in whooping-cough. (See Med. and Chir. Trans. Art. 3d.) In the second stage of this disease, the patient is free from fever; but the fits of coughing become more severe and of a convulsive nature, with a very abundant secretion of phlegm, and which it is alleged by some, is remarkably acrid and irritating to the lungs. The object of the practitioner at this period of the disease is, by the use of tonics, to diminish the morbid sensibility of the lungs and of the whole system, and thereby to diminish the lax state of the excretory vessels of the lungs, and to lessen the discharge, analogous to the treatment advised in the passive stage of ulcerated surfaces, or of catarrh, or phthisis. Various remedies are in use for this purpose.

All practitioners agree in the advantage of change of air in this complaint, and especially in removing patients from inland situations to the air of the sea coast. 2. In this second stage of the disease, exercise in the open air should be made use of daily, and is among the best means of restoring both the strength and appetite of the patient, both of which are sensibly impaired by the continuance of this complaint. 3. Stimulant and tonic medicines are also found beneficial in lessening the sensibility of the lungs to the cause of the disease, for this purpose some administer the tincture of bark, or the tinctura amara, others the tincture of cantharides, and occasionally these combined. (See Lettson's Medical Memoirs.) Practitioners have been led to this internal use of the cantharides by the salutary operation of blisters, particularly when they produce strangury; (the sulphate of quinine is a good substitute in some cases.) Some prescribe the stimulant or foetid gums, as the lac ammoniac, or myrrh; musk has been much used, but has failed often. Others again have recourse to the oil of amber, or Margreef's artificial musk, which is considered by some as very efficacious in this disease. In my opinion it has no peculiar advantages over any other tonic usually administered in this complaint. Margreef's receipt is, *ol. succini.* (amber,) *ʒj.* *nitric acid* *ʒiij.* *M.* to stand two or three days well mixed; to be then well washed, and to be given dissolved in water to the amount of twelve grains a day, beginning in small doses. Thomas directs it to be dissolved in alcohol, and to give it in doses of four or five gtt. three or

four times a day. But in this stage of the disease, such is the great quantity of phlegm secreted and inundating the lungs, that it is with difficulty discharged by the ordinary efforts of expectoration; in this case a mild emetic, and one that does not greatly debilitate the system, may be occasionally administered with great advantage; such an emetic we possess in the antipertussis, or what appears to be the same medicine, the solution of white vitriol, as directed by Dr. Moseley, and hence called Moseley's solution, as follows: sulphat zinc ʒij. ; coccinell. contus. gr. ij. ; aq. bullient. ℥j. ; sp. lavend. ʒij. M.; from a dessert to a table-spoonful to be given, and repeated in ten minutes if the first does not operate. This should be daily given while the phlegm is oppressive and in great quantity. Practitioners recommend a variety of other remedies in this disease, but without any definite object in view. Arsenic is recommended by Dr. Simmons, of Manchester, (see *Annals of Medicine*, for 1797,) who states that by the use of Fowler's solution he is enabled to effect a complete cure in the course of a fortnight; but it is to be remembered, that he also makes use of venesection and emetics, which are probably more useful than the arsenic. Others again make use of the acetate of lead, first recommended by Dr. Forbes, of Edinburgh, but this is certainly a hazardous prescription, especially for children. The oxide of zinc, from gr.ss. to a grain, two or three times a day, has been employed; the nitrate of silver also, from the 12th to the 8th part of a grain has been given with benefit; the sulphate of quinine, especially where the fits return periodically, is useful as well as the arsenic solution. Another valuable external application in whooping-cough is the oleum succini, mixed with common oil, and made more stimulating by the addition of the oil of cloves. This combination is now sold as a quack medicine, under the title of Roche's embrocation for the whooping cough; it consists of olive oil ʒij. ; oil succin. oil cariph aa. ʒs. M. (See *Paris Pharmacologia*, vol. 2, p. 305.) I have used it with excellent effect on a sick child. In like manner Hemlock, the cicuta, conium maculatum, has been used, and is a favourite remedy with Dr. Butter; giving a grain in the course of a day to infants under six months, and ten grains a day to adults, gradually increasing it. I have never found benefit from it. His practice, and his theory of this disease, are alike to be disregarded. He places the disease in the alimentary canal!! He too has been tak-

ing a lesson out of Broussais' book, like our New York physicians who consider croup a disease of the stomach, and prescribe for it the corrosive sublimate—"credat Judæus Appella, non ego." Hyosciamus, Belladonna and Digitalis have been made use of; but in the second stage of this disease such narcotic and debilitating remedies should all be avoided; and we certainly have more efficient means of removing the more violent symptoms attendant upon the first stage. Another means of exciting the system in the second stage of hooping-cough is by the internal and external use of various stimulants, particularly of the alliaceæ, viz. garlic and onions; the syrup of those articles administered internally, and the ointment for external purposes, are certainly not only admissible, but are very proper in the second state of this disease; but in the first, they should be altogether avoided as too exciting to the system. Prussic acid has been lately administered with great success by Majendie, gtt. xx. gtt. xxx.; aq. font. ℥iiij.; sp. lavender gtt. x. M.; a dessert spoonful three times a day, gradually increase it to ℥ss. three times a day. I have made great use of it, and with benefit, but caution should be observed in the use of it; be careful too to ascertain the strength of the preparation, and whether it is fresh made or old, or has been exposed to the action of light, which changes its qualities and thus leads to deception; fatal cases from its use have occurred in France. Fresnoi makes use of the extract of the leaves of the *Rhus vernix*, gr. iv. of the extract dissolved in ℥iv. of syrup; a tablespoonful every three hours to a child. The diet of the patient, in the chronic stage of this disease, should consist of animal food; the moderate use of wine, porter, milk-punch, and other means of invigorating the system; while in the first stage of the disease, as in the phlegmasiæ in general, it should be simple and antiphlogistic.

LECTURE XLIV.

PNEUMONIA.

PNEUMONIA is well defined by Dr. Cullen, viz: "Pyrexia, dolor in quadam thoracis parte, respiratio difficilis, tussis." The symptoms of pneumonia in general, are those of the phlegmasiæ, viz: 1. In its invasion, chills of irregular duration. 2. The symptoms of general febrile excitement, pulse frequent, respiration hurried, skin hot, in some cases flushed, excretions all diminished, tongue dry, generally furred, with great thirst.

Its local symptoms are, pain in the chest, more especially in the part the seat of the inflammation, but attended with some peculiar or diagnostic symptoms, according to the texture of the particular part in which the inflammation may be seated. If seated in dense membranous parts, as the pleura, either that lining the ribs, that inclosing or dividing the lungs, or that constituting the pericardium, it will exhibit one train of symptoms, while inflammation affecting the mucous and secreting membranes of the bronchiæ and lungs will present a less violent concurrence of symptoms. So again, inflammation affecting the membrane connected with the diaphragm, will be attended with phenomena which are peculiar to that form of pneumonic inflammation; while again, the same inflammation, if seated in the pàrenchymatous or cellular portion, constituting the chief substance of the lungs, which is less sensible and more yielding than the dense and comparatively inelastic membranes before mentioned, will be more insidious in its character, and will present appearances altogether opposite to those which we meet with in those that have already been referred to. Let me here remind you of the divisions or species

of inflammation, as seated in different organs, viz: 1st. The loose cellular membrane and muscular fibre, and its corresponding tendency to suppuration. 2d. The mucous membrane performing excretion, and which, to a certain degree, moderates the violence of the inflammation. 3d. The inelastic dense membrane, which has no outlet. 4th. Parts highly organized by a plentiful supply of nerves, as the skin, stomach, intestines, uterine organs, &c.

The different terminations of these varied forms of inflammation, and the treatment they severally demand, according to the texture of the part and the cause that may be operating, will be fresh in your recollection. So, in like manner, we have the different species of inflammation exemplified in the various forms of pneumonic inflammation. In pleuritis we have an example of inflammation seated in the dense membrane. In bronchitis or peripneumonia notha, we find the mucous membrane showing the less active grade of inflammation, while in the cellular or parenchymatous substance of the lungs we have the tendency to purulent effusion; and in the more sensible organ, the diaphragm, we have those that point out a peculiar connexion with the brain and nervous system.

Inflammation of the pleura, pericardium, and diaphragm, as contrasted with that of peripneumony. We will at this time recount the symptoms the three first possess in common; when we come to carditis and diaphragmitis, their peculiarities will be then noticed. Dr. Cullen's definition is this: "*Pneumonia pulsu duro dolore plerumque lateris pungente sub inspiratione præsertim acuto; decubitu in latus molesto; tussi dolentissima, initio sicca, postea humida sæpe cruenta.*" Pneumonic inflammation, when it affects the parts first mentioned, for the most part attacks the robust and full habited, those of a sanguine constitution, and frequently young children. Dr. Cullen most strangely says that it rarely attacks those under the age of puberty. Pulse hard, corded, small, frequent; tongue white, furred, covered with paste and attended with great thirst.

Pain acute in the part, especially upon taking a full inspiration there is some interruption and cough, countenance frequently pale, even at the attack. The extremities sometimes cool from the same cause, with even a sense of coldness. The secretions from the lungs and whole system diminished, the cough attended with an acute sound, great pain, the child cries, the cough

is dry, harsh, and frequently repeated in the same paroxysm of coughing. Position frequently in pleurisy erect. Sometimes painful on one side: sometimes on the side affected, at other times the opposite; there is great variety in this respect. Again, as in the varieties I have introduced, the inflammation sometimes has been observed to be seated more especially in the mediastinum, in which case the pain extends from the sternum to the back between the scapulæ. As this form of pneumonic inflammation exhibits the same general symptoms, and requires the same treatment as in common pneumonia, it is therefore unnecessary to be solicitous about its characteristic symptoms; not so with regard to carditis and diaphragmitis: these require more expedition, especially carditis, and some peculiar attention to the affections of the nervous system attendant upon diaphragmitis. I have, therefore, assigned to carditis and diaphragmitis to each a distinct generic place. And in carditis such is the great dyspnœa attending inflammation when seated in the heart, that the erect posture is the only one the patient can endure. After this enumeration of the symptoms attending pneumonic inflammation, we cannot commit the error of Baron Haller, by confounding this disease with that rheumatic affection to which the muscles between the ribs are liable, called bastard pleurisy; for as I before told you, Haller believed pleurisy to have its residence in the intercostal muscles; for the membranes of the lungs he considered to be insensible. In such rheumatic affections, attended with spasm, cough, fever, &c., venesection, a purge, vol. or camphorated liniment, a blister, will generally effect a cure in a very short time. Pneumonic inflammation, left to itself, generally in a few days runs its course and proves fatal, unless the symptoms may be moderated by the remedies that may be employed, or by the spontaneous evacuations that sometimes take place, such as hemorrhage or diarrhœa. Here again we ought surely to be surprised at the remark of Dr. Cullen, that a diarrhœa in the commencement of pneumonia, is not a favourable symptom; on the contrary, like a blood-letting, it frequently affords immediate relief. Pneumonic inflammation has various terminations; it takes place either in resolution or in adhesion to the pleura lining the ribs, and a purulent effusion constituting empyema, in which the matter finds its way between the ribs, and points externally. But although an adhesion will most usually take place, and the matter

be circumscribed in the manner just mentioned, this is not always the case. The matter, 3dly. is in some instances effused into the cavity of the chest. Sometimes again, 4thly. the inflammation, though originally seated in the pleura, involves the cellular substance of the lungs, as well as the membranes—i. e. a vomica or collection of purulent matter, is formed in the substance of the lungs themselves, as abscess takes place in other cellular membranes; and if the collection be large, upon bursting, it frequently proves instantly fatal, entirely covering the surface of the lungs, and immediately suspending respiration. Sometimes fifteen or twenty days elapse before the collection bursts through the parietes that enclose it. But how is such vomica known to exist? By the frequent chills, by the dyspnoea, cough without expectoration, a livid colour of the body, and a regularly formed hectic; two paroxysms in every twenty-four hours. If such collection be small, and the habit not scrofulous, i. e. not previously debilitated, and there be no peculiar predisposition from make of chest, or habit of body, to phthisis pulmonalis, it is frequently thrown off without any permanent injury to the constitution, analogous to the sudden rupture of a blood vessel in the lungs. The patient as readily recovers, as from the rupture of a blood vessel, or an abscess in any other part of the body, provided there be no predisposition to consumption; so in some cases where abscess is produced, it ends without permanent phthisis. (Case of Abm. Franklin's child; recovered by bark and vitriol, after such accumulation and discharge of matter, the result of pneumonic inflammation.)

5. In some instances, again, the matter may be absorbed, and the parts remain in a sort of scirrhus state, i. e. from the union of many of the cells in a solid mass, as you may see illustrated by the dissections made by Quarin, and the indurated lungs as they are described by Cleghorn.

But 6. If the collection be large, and it occurs in phthisical habits, it most usually ends in consumption of the lungs, attended with hectic fever, frequent chills and spasmodic affections of the chest, showing themselves in pain, cough, difficult breathing, and general emaciation, constituting what is vulgarly called a galloping consumption.

7th. In some cases a profuse discharge takes place from the surface of the lungs, without the destruction of the lungs themselves,

attended with comparatively little fever, but the patient, nevertheless, gradually wasting.* In such case it frequently proves a disease of long duration. But where such predisposition to phthisis does not exist, and expectoration is going on without chills or fever, as in chronic catarrh, the patient may be frequently relieved, especially if well managed by the physician; I mean by suitable stimulant and tonic means, but not by relaxing the patient; (remember the analogy to ulcers). It is in such state of the lungs that the Lichen Islandicus, like the horehound, has been found very beneficial, and has given credit to physicians as possessing skill in the cure of consumption. Pneumonic inflammation, too, in some cases ends in sphacelus. The lower portion of the membrane covering the lungs has been found adhering to the membrane lining the ribs, and some parts of it sphacelated; not merely gangrenous, but actually sphacelated—(facile lacerabilis).

But when pneumonia is seated not in the dense membranes inclosing the lungs, or lining the ribs, but the mucous membrane and cells of the lungs, its symptoms differ considerably from those enumerated. This form of inflammation has also been well characterised by Dr. Cullen. Read his definition of peripneumonia, (Nosologia, vol. 2. p. —.) “Pulsu non semper duro, aliquando molli, dolore thoracis obtuso; respiratione perpetuo difficile, sæpe non nisi trunco corporis erecto exarcenda; faciei tumidæ colore purpuero; tussi plerumque humida, sæpe cruenta.” This includes the peripneumonia notha of Sydenham, Huxham, and Boerhave; and the bronchitis of Dr. Badham, which is a milder form of the same disease, being confined chiefly to the mucous membrane; but, by the by, sometimes more dangerous, especially when it attacks the aged. I will just remark that the discharge of blood does not very often take place in the beginning. The pulse is always soft, compared with pleuritic inflammation. Dr. Thomas makes a singular ground of distinction between what he calls true and spurious peripneumony. He says when it arises from sily blood obstructing the vessels of the lungs, it is called true peripneumony; but when it proceeds from a thick viscid matter producing a similar effect, it is known by the name of spurious peripneumony! What is the meaning of this language? The truth is, the peri-

* See Bedingfield, p. 97. “Pus thrown from the bronchiæ, yet not the slightest vestige of an abscess in the substance of the lungs.”

pneumonia notha is a mere catarrhal affection confined to the bronchiæ and secreting surface with little or no pain; the other involves the whole cellular substance—they are mere grades, however, of the same affection, though Dr. Badham thinks otherwise. (See Thomas, p. 136, 4th edition.)

Peripneumony generally attacks those more advanced in life; frequently the aged; not always; in some cases the young are the subjects of it; especially where they are, from make of chest, or from some hereditary scrofulous taint, predisposed to pulmonary complaints; or in cases where a premature old age may have been induced, by intemperance, peripneumony is apt to occur, and usually proves fatal. In like manner, a previous attack, even in the young, lays the foundation of subsequent returns of the same form of pneumonic inflammation upon exposure to cold. In this disease the pulse is frequent, soft, and full; not as in pleuritis, corded; not like the tenor string of a musical instrument, as described by Dr. Thomas. Although, in many cases, Dr. Thomas is an excellent compiler, it is plain he does not draw his distinctions from the bedside, in the disease now under consideration. The pain is less acute, and under the sternum, and more generally diffused over the chest; not restricted to a particular spot, as in pleuritis. But the distress is sometimes very great, and attended with much anxiety; the labour of respiration, and the sense of oppression in some cases, especially in the aged, is such, that the patient cannot possibly lie down or the feeling of suffocation ensues.

In these cases the violent spasmodic affection of the lungs resembles the dyspnoea of asthma, and although occurring in old age it is only to be relieved by the means of counteracting inflammation; in younger subjects, and in the ordinary attacks, when the patient lies down it is one of the peculiarities of this form of pneumonia that he lies upon the back, not upon the side. Dr. Kuhn observed, that he could always distinguish by posture alone the form of pneumonia, whether it be a pleurisy or a peripneumony; but add to this the spasmodic wheezing in respiration, and the comparatively loose cough also attendant upon it; the countenance in peripneumony too is flushed, livid, purple, swelled, and manifesting from the want of that interchange between the blood and the atmosphere, the expression of great

anxiety and solicitude; the tongue is frequently moist, or slightly furred, not the white fur noticed incorrectly by Thomas! the expectoration is diminished, but not as in pleurisy totally suppressed; the discharge is thin and sharp; the skin not so hot and dry as in pleurisy; the urine is even turbid, not so transparent or high coloured as in pleuritis. The disease, therefore, is more insidious; its termination too is usually different and more varied than pleurisy; true it frequently ends by resolution; and in some instances, especially in young subjects, and where the cases have been misconceived, it has ended in abscess, and that too notwithstanding the partial discharge by expectoration, that so commonly takes place in peripneumony; in other instances again, in an effusion of blood, or by serum poured into the cavity of the chest, or in the interstices of the cellular substance of the lungs, as was the case with Dr. Charlton, (he objected to venesection and died in twenty-four hours.) In full habits of body; and in aged persons if not immediately relieved by depletion, the symptoms of effusion may be generally looked for in three or four days; they die of hydrothorax. In others again it ends in a purulent-like mucous secretion from the surface in the form of a chronic catarrh; while in others an inflation of the lungs ensues, in which all the small vessels are overloaded, and without any or very inconsiderable discharges. In this case, if the disease be protracted it assumes the typhoid form of fever; in young subjects this event is of frequent occurrence; a new accession of symptoms now takes place, and is occasioned by a vitiated state of the habit, the consequence of long continued fever, and probably in part from the want of a due determination of the blood, which is no less essentially connected with a healthy state of the circulating fluids than it is with life itself. In this new state of things the expectoration becomes changed from its natural state; in the early stage of the disease it was thin, now it becomes glassy and more or less tinged with blood; the tongue too shows the typhoid character; it becomes brown, the lips exhibit more or less of a similar dark colour, the excretions are all offensive, delirium ensues, with the usual evidences of typhus. A peculiarly active treatment is now called for in this advanced stage of the disease, to secure the safety of the patient. The disease now continues depending upon constitution, from seven

to twenty days. These are not the terminations usually of pneumonia when seated in the dense membranes investing the lungs; in the last the symptoms are more acute, and end in suppuration or sphacelus, nor is that typhoid termination of peripneumony frequently met with in the aged and the full habited; there it ends by effusion in two or three days, when it proves immediately fatal, or in hydrothorax which soon proves so; or sometimes, when the attack is slight it ends in a chronic catarrh.

CAUSES OF PNEUMONIA.

Those predisposing to pleuritic inflammation are—1st. The sanguine temperament and plethoric habit, in those remarkable for a vigorous state of the digestive organs; for a weak stomach liable to dyspepsia is rarely of the sanguine temperament. 2. A previous attack renders the part liable to a repetition of the same disease. Hoffman prescribed for the same disease in the same person four or five times in the same season; so of hives. 3. The season of the year predisposes to returns of pneumonia; it is accordingly of frequent occurrence in wet and cold weather, and less frequently met with in the summer season. In a wet and cool atmosphere, it is not unusual at any season, say the army physicians. 4. Peculiar situations, as the seaboard and islands. 5. Make of chest; hence those who are inclined to phthisis are very liable to pneumonic inflammation; so far, then, there is a hereditary predisposition in some families to pneumonic complaints. The restraints imposed upon the chest by dress, or the habit of stooping, may also be included under this head. 6. Scrofulous habits of body are said to be liable to pulmonary complaints, especially in Great Britain, where the climate, moisture and cold are combined with scrofula, to produce diseases of the chest. 7. The predisposition to peripneumony in particular, is in some cases the reverse of the former, not confined to the vigorous and the young. To the last form of pneumonic inflammation we find the aged, those of sedentary habits, and those of lax fibres combined with fulness of the vessels, peculiarly liable. In habits, too, debilitated by intemperance in the use of spirituous or fermented liquors, especially those predisposed to phthisis, peripneumonia is readily induced. 8. Those, too, who

are debilitated by previous affections of the windpipe are very easily acted upon by the exciting causes of pneumonic inflammation. Mr. T. P. was, in infancy, frequently affected with croup; it has left great liability to pneumonic inflammation in the form of peripneumony. Probably these facts are to be accounted for by the debility which more especially shows itself in the venous system of the chest, in the aged, and in the feeble, and thus produces this surcharged state of the lungs in peripneumony.

The exciting causes are—1. Those applications which are calculated to diminish or check the excretions, as, (1.) Cold, exposure to cool air when coming out of a heated room; or exposure to a stream of air; (2.) change of dress; or not adapting the dress to the vicissitudes of the weather. 2d. Acrid materials applied to the lungs, whether mechanical or chemical; as the fine dust inhaled from various employments. Hair-dressers, stone-cutters, workers in marble, scythe grinders, &c. are hence liable to pneumonic inflammation, and consumption of the lungs. The fumes of the different acids, in like manner, produce excitement in the lungs which ends in inflammation. In like manner it has been ascribed to the noxious exhalations of Mount Vesuvius; Vivenozi, Besonius, and Bovillet, in his *Memoirs on Epidemic Pleurisies*, have all recorded this disease as derived from this source. (See Good, vol. 2. p. 358.) 3. Extraordinary exertions of the lungs in public speaking, especially when those exertions are made after long intervals; in that manner, pneumonia and hemoptysis are frequently induced in clergymen, by their Sunday exertions—their “pulpit sweats”—after remaining quietly in their studies during the week. In some instances, as in hypochondriacs, with their gorged and distended viscera, from full feeding and sedentary lives, they are greatly benefited by such inordinate exertion. The gentlemen of the bar, who take more bodily exercise, and who are in daily habits of public speaking, are by no means in a peculiar manner liable to pulmonary attacks; on the contrary, a steady exertion of the lungs is rather calculated to invigorate those organs. 4th. Bodily exercise carried to excess, as dancing, especially in a heated room, with the usual accompanying excitements of wine, beauty, &c., exposes the lungs, in some instances, to an attack of this nature, especially where they may be otherwise predisposed.

CURE.

The first indication after the avoidance of the remote causes, is to diminish the determination of the circulating fluids to the part affected, keeping up the irritation, the proximate cause of the inflammation, by evacuations from the blood-vessels, and by such means as will, at the same time, relax the system, and thereby restore the excretions in general.

Venesection.—Formerly there was great dispute, whether the blood is to be drawn from the side affected or the opposite to that of the seat of the disease. The earlier Greeks contended for the former, the Galenists and Arabians for the latter. The dispute rose so high at last that the colleges not being able to settle the point, referred it to the emperor Charles the IXth; but he, to the confusion of all parties, himself died of a pleurisy, before he delivered his judgment—his death being ascribed to the blood, being drawn from the wrong side. This is usually directed to be done from a large orifice. It is certainly proper that the orifice should be so large that we can take the necessary quantity of blood, to afford permanent relief; but it is not required that we should produce deliquium, except in very feeble habits, where you do not wish to draw much; for taking blood from a very large orifice, you frequently produce deliquium before you have taken one-third of what should be drawn. Eighteen or twenty ounces should be taken under ordinary attacks; but if the disease be a pleurisy, it is oftentimes necessary to draw thirty or thirty-six ounces. If the orifice be very large, you will not do this before you produce fainting; even then it will be proper to place your patient in an horizontal posture. As to the quantity to be drawn, some caution too, is to be exercised, according to time of life, and habit of body. In the athletic adult, you can scarcely take too much, or repeat it too frequently, until the pain is subdued, or the respiration relieved. In some infants, and one, too, at six weeks, I have been obliged to draw blood half a dozen times before they were relieved. Avoid, however, any unnecessary waste of the vital fluid. Be careful, too, not to be misled by the singular appearance of the blood drawn, for frequently this appearance is found in the advanced stage, and not in the first. There is nothing more deceptive. You will see this fully noticed in many authors; as by Wilson. (See vol. ii. p. 235)—by Macbride, Manning, Rush,

Millar in his Diseases of Great Britain, and others. Bedingfield too, frequently notices the fallacy of the buffy coat as a test of inflammation. Even in phrenitis, as well as in pneumonia, he found cases of the most active inflammation, without the buffy coat. Bailly, too, in Laryngitis.* Look at the consistence of the blood, especially the quantity of coagulum; the dark colour, too, is some evidence of the quantity in the system, and that it circulates less freely through the lungs. This is the case, especially in adults—in children, the blood is generally of a bright florid red colour. The circulation is more active in infancy, consequently it passes more rapidly through the lungs, and its carbon is disengaged in proportion to the frequency of respiration. This circumstance accounts for the very bright red colour which even the venous blood exhibits in children and in youth—especially in the hurried circulation during inflammatory diseases. I know a physician who, on drawing blood, became alarmed at the florid colour of the fluid, and its rapid flow *per saltum*, and concluded he had opened an artery. We must also regard the period of the disease at which we draw blood, with some attention. In the case of Counsellor Sampson, bleeding was not resorted to till the ninth day—but he was cured by it. In a patient of Dr. Dick's at Alexandria, I advised venesection on the eleventh day, and he was cured. In the case of a black man, who had been six weeks ill, and in whom the symptoms had remitted, being moderated by spontaneous discharges, or the means that had been prescribed for pneumonic inflammation, the lancet was employed with success. Dr. Cullen's fourth day, or even his fortnight, becomes then of little importance, as our guide in the use of the lancet. The best and only rule, I believe, is to bleed while there is difficulty or pain upon taking a full inspiration, or it excites coughing.

2. By cathartics. The saline are especially useful. It is a general rule to avoid emetics, especially in adults—in children they are useful—but then most beneficial after venesection and cathartics. A late practice, however, has been introduced in Italy, to treat this disease by large doses of tartarised antimony.

Blisters—both in pleurisy and peripneumony. Sudorifics—antimony tart—James' powders. Use caution as to pectorals, except those consisting of antimony and calomel. Laudanum, or opiates

* See Med. Trans. vol. iii.; one of the cases had no buffy coat.

in any form, should be sparingly administered, except where the cough is very troublesome, and out of all proportion to the other symptoms of inflammation; or in young children, when the phlegm is generally swallowed, and, as in whooping-cough, produces griping, and sometimes diarrhœa—laudanum is then necessary, and may be given in combination with spiritus mind.; or the Dover's powder may be used. You may also use the general bath, warm, not cold, as Thomas recommends; and may employ foot bathing, tepid fomentations, inhaling the steam of warm water. Here, too, digitalis, perhaps, may be well resorted to.

DIET

Simple, and strictly corresponding with the antiphlogistic course that has been advised. Mucilaginous drinks should be taken frequently, but in small quantities, as bran tea, rice water, barley water, flax-seed tea, and those not of too great consistency—we otherwise fill the blood vessels and counteract what we have been doing by our depletion. Toast water and common tea are also proper beverages in this state of the lungs. The acid fruits in water, as weak lemonade, currant jelly and water, apple water, are also suitable drinks, except when the patient may be in the use of mercury or antimony; in that case they give pain, and in some cases, bring on an inordinate catharsis.

Regimen.—Pay attention to the temperature of the drinks administered; the air of the room; the baths which may be employed; the quantity of bed clothing; and avoid the stimulus of company and business.

The treatment of pneumonia will also be regulated by the various terminations of the disease, when we fail by the means pointed out to effect resolution. When resolution takes place, the disease frequently ends in a copious expectoration, when all stricture is removed, and the various functions are restored. But it also, in some instances, especially when a predisposition to phthisis exists, leaves an obstinate chronic cough. This is to be immediately counteracted by the means already pointed out when treating of the passive state of the lungs in chronic catarrh, viz: by exercise in the open air, by tonics, and especially by the stimulant pectorals, and suitable stimulating nourishments. This leads me to a few observations on the treatment of peripneumony.

1st. As this form of inflammation occurs most generally in the aged and infirm, and in those debilitated by intemperance, it leads us to be more cautious in the use of the lancet, which sometimes aggravates the oppression in the lungs by the debility induced. But we for the most part, have as much occasion for blood-letting in this form of pneumonia, as in pleuritic inflammation, though not to the same extent. In peripneumony, too, we depend for relief upon expectoration more than in a pleurisy. In the use of cathartics therefore, we must be guarded lest we prostrate the system so much as to interfere with this discharge from the lungs. When expectoration has begun, the cathartics employed should be mild in their operation, lest they suspend that discharge which, of all others, unloads the diseased cells and vessels of the lungs, and removes the congestion. Sydenham remarked that, in the last stage of small pox, active purging interfered with the natural terminations of the disease. So in peripneumony, so also during the lochial discharge, much purging induces a check of those discharges, followed by an aggravation of the disease that may exist at the time, and in the latter case induces uterine congestion and inflammation. Our chief dependence in peripneumony is to restore the natural excretions, particularly by the skin. With this view, small doses of calomel and James' powders, antimonial wine and laudanum, the antimonial solution, Dover's powders, or the *sp. mind.* are called for.* If the oppression is great, blisters to the chest become necessary. Inhaling the steam of warm water, or of an infusion of hops, will also greatly contribute to unload the chest in this state of congestion—this, too, will be greatly aided by the frequent use of some mild diluents, taken frequently, and of a proper temperature, they act as fomentations to the bronchiæ and lungs, at the same time that they promote the general excretions of the system.

In the young, after venesection, emetics are advantageously prescribed for the purpose of unloading the lungs of the matter oppressing them, as well as their general operation upon the system, when the inflammatory, or active stage, has been subdued, and symptoms of a chronic catarrh remain, especially in the aged; and indeed in the young sometimes great sensibility of the lungs frequently remains from weakness alone. It becomes necessary

* The pectoral mixture in some cases will be preferable.

to preserve the tone of the system, and to excite the lungs and organs concerned in expectoration by the use of appropriate stimuli. The lac ammoniac, or the myrrh, the snake-root, the horehound, bone-set, lichen, are now indicated, and when the chest is free from obstruction, bitters and other tonics, adapted to the general system, will rapidly contribute to the recovery of the patient. A more stimulant nourishment, as sago, with wine, syrups, and a portion of animal food, as oysters, a soft boiled egg, &c. may now be allowed, and with great advantage to the sick. In the young, peripneumony, like pleurisy, sometimes ends in abscess or a vomica; sometimes in gangrene, by hemorrhage, by an effusion of serum, or it ends in typhus fever. If a peripneumony ends in the effusion of pus, constituting a vomica, or empyema, it usually does so in six or seven days, exhibiting a peculiar train of symptoms denoting such purulent effusion, viz. frequent chills, a dark purple visage, and dyspnoea, especially in the horizontal posture; but the matter may not be evacuated, that is, the abscess may not burst, in less than fifteen or twenty days. The matter, when it extends to the pleura lining the ribs, and involves the muscles between the ribs, forming a tumor externally, calls for an operation to discharge it; in this operation care must be taken always to cut upon the upper portion of the rib, in order to avoid wounding the artery which runs in the groove at the lower portion of the rib. In some cases the matter is discharged between the lungs and ribs into the cavity; it is then usually fatal; but when conveyed as just mentioned, externally, the patient sometimes escapes. When matter has been poured out from the diseased parts, whether in vomica, empyema, or from the surface, whether in the cavity of the chest, or externally from the surface of the lungs, tonics and stimulants are then to be resorted to, to heal the ulcerated surfaces, or phthisis is the inevitable result. The remedies have already been enumerated under the head of ulcer, and in the treatment of the passive stage of common catarrh. Again it ends in serous effusion, or hydrothorax. If symptoms of irritation still remain while such effusion is going on, the means of moderating inflammatory action must still be employed, and a diet merely sufficient to sustain the system to be directed; but when pure debility and hydrothorax follow without febrile excitement, accompanied too as it frequently is, with anasarca and a general leucophlegmasia, then the active use of tonics becomes

necessary; chalybeates, bitters, with the mineral acids, and astringents, wine, &c. If the disease terminates in gangrene, nothing is to be done; it ends, and suddenly, in three or four days. A more common termination of peripneumony in the aged or the feeble, is in typhus, or as denominated, typhoid peripneumony; in such case the disease is frequently protracted to fifteen or twenty days continuance, depending upon the power of the constitution and time of life. This stage is evinced by impeded and laborious respiration; the countenance livid, with stupor, delirium, and in some cases with convulsions, which generally prove fatal. The cough too is dry and unyielding, and the matter expectorated glassy and adhesive, and oftentimes tinged with blood. I would here, however, remark, that bloody expectoration is itself not an unfavourable symptom, for it relieves the lungs of the great congestion that exists in them. The pulse is now soft, irregular, and frequent; the skin dry and attended with the same pungent heat as in idiopathic typhus fever. The tongue too is brown as in typhus; and there are delirium, subsultus tendinum, shiverings, and regular exacerbations, with a hectic cheek somewhat similar to phthisis pulmonalis. The remedies indicated in this case are similar to those recommended in typhus fever and in cynanche maligna. Always too, attend to the general state of the system, and especially avoid large evacuations; among the best means to be employed are such as operate upon the excretions, viz: aristolochia serpentaria, the Virginia snake-root; the Polygala senega ʒij. to ʒviij. of water; calomel with opium; the vol. alkali, in gr. iv. or v. in bolus, every three hours; vegetable nourishments, especially such as contain a large proportion of mucilage; arrow-root, sago, barley, &c. and these to be given with wine, the quantity of which is to be adjusted to the state of the system; or wine may be given in the form of wine-whey; inhaling the steam of vinegar and water, by Mudge's inhaler, or with closed curtains. By these a favourable change is generally effected in all the secretions of the system, by the skin and the lungs, the expectoration is more natural and plentiful, and the discharge more easily promoted; the tongue cleans, the pulse fills, and becomes less frequent, the mind and the senses are improved and restored; now too may be given tonics, such as bitters, sulphate of quinine; the mineral acids, &c. may advantageously be used.

LECTURE XLV.

DIAPHRAGMITIS AND CARDITIS.

DIAPHRAGMITIS was anciently denominated paraphrenitis, from *παρεα*, and *φρην*, the mind or soul, because the diaphragm was once supposed to be the seat of the mind. It is well known that a very intimate connexion exists between the disease of this organ, the stomach, the brain, and the mind. Delirium, and the risus sardonicus, are not unfrequent symptoms of the disease of this partition between the chest and belly, as well as of gastritis. Boerhaave has given a very good description of this form of pneumonic inflammation; but Dr. Cullen does not believe that it possesses any peculiarities. Indeed he most strangely denies that it possesses any diagnostic symptoms. He ascribes those which are usually deemed such, merely to the greater degree of fever attendant upon it.

This disease may be known—1st. By the greater sense of chilliness, pain following the course of the diaphragm, along the margin of the ribs, attended with a sense of burning; add to this, a stricture about the præcordia, and around the false ribs, as if girt with a cord.

2d. The pain extends to the loins, following the connexion of that muscle (the diaphragm) with the back. The respiration, too, is anxious, and chiefly carried on by the intercostals, so affected and irregular is the action of the diaphragm, the seat of the disease. The hypochondria, too, are drawn inwards, and kept at rest.

3d. It is especially attended with irritations of the phrenic nerve, showing itself in gaping, sneezing, hiccup, delirium, sometimes convulsions, and other evidences of a general affection of

the nervous system. We are not, therefore, surprised at the ancients denominating this variety of pneumonic disease parphrenitis.

After this view of the peculiarities of diaphragmitis, you will not be at a loss to recognise it when you may meet with it in practice. It, however, will call for your special attention. Remember that Cleghorn once mistook a case of inflammation of the diaphragm for a common pleurisy. After death he found the diaphragm to be exclusively the seat of the inflammation.

TREATMENT.

Venesection must be used very freely. After the bowels have been emptied, there must be early attention to the skin, and the means of restoring the general excretions, such as sp. mind. and laudanum, and the Dover's powder. You will perceive I inculcate the early use of laudanum. I also advise the liberal use of it in this particular form of pneumonic inflammation; but not omitting other general remedies that have been directed in the treatment of the other forms of pneumonia; viz. the antimonial solution, the early use of blisters, with the same attention to diet and regimen that have been so frequently inculcated in the management of the phlegmasiæ.

CARDITIS.

Inflammation of the heart, or its inclosing membrane, the pericardium, which should in strictness of language be denominated pericarditis. That such disease exists we have abundant evidence, in the dissections that are recorded by Dr. Baillie, of London, in his *Morbid Anatomy*, in which you have also seen illustrated, the various forms of pneumonic inflammation, and its consequences. In some of those dissections, in cases of carditis, pus has been found, actually effused, among the muscular fibres composing the heart itself; and in the inflammation of the pericardium you also see the effusion of lymph, or gelatinous matter, actually constituting an additional membrane, superadded to the pericardium, analogous to that formed upon other membranous surfaces. Dr. Cullen observes that this disease has no characteristic symptoms—none distinguishing it from pneumonitis. Pro-

bably Linnæus, for the same reason, has taken no notice of carditis in his arrangement. Vogel, too, is almost induced to reject all distinctions between this disease and ordinary pneumonia, for he says of it, "*Cordis inflammatio fere ut in peripneumonia.*" I never saw but one case of this disease in which its characters were distinctly marked; in that my attention was called to it by the late Dr. Richard Bayley, of this city, in 1788. It was in a Mrs. H. who is yet living; she was sitting up in bed, showing great anxiety, oppression, and distress, like that which frequently attends upon peripneumonia.

But besides this sense of oppression, the patient, in carditis, and still more especially where the investing membrane of the heart is the seat of disease, complains of acute pain in the region of the heart—pointing to the very seat of suffering—this symptom was very remarkable in the case I saw. Besides these, the circulation was very much affected—the pulse was very rapid and irregular, with great palpitation, great anxiety, a constant effort to cough, a tendency to delirium, and an inability to lie down. Such, you will perceive, are the symptoms I have called your attention to in my nosology. Between inflammation of the heart and its investing membrane, I cannot point out any distinction, unless it be in the acuteness of the pain and the corded state of the artery. In some cases we know that the heart has been found to contain a great deal of pus after death, when the sufferings of the patient have been not very acute—purulent matter, too, without ulcer. Hewson, it is said, first noticed this fact, and that Hunter established it, that pus is a secretion from the inflamed vessels. Morgan, of Philadelphia, was the real discoverer. (See his Thesis.)

The same causes that have been enumerated when speaking of pneumonia, are to be considered as creating inflammation of this very important viscus, including wounds. The same treatment too, is called for; but it is to be employed with more vigour. The constant anxiety, oppression, palpitation, constant effort to cough, the inability to lie down, the rapid and irregular circulation, all call for the most active means of depletion—by copious venesection and other means of diminishing the force and frequency of the circulation; and if the patient be not relieved, the lancet and other evacuants should be repeated.

There is, perhaps, no disease that calls for more decision and

activity in our prescriptions, than the inflammation of the heart. What I before observed of the necessity of copious blood-letting upon occasions of this nature, perhaps is more peculiarly applicable in this than in any other disease of this class. Let me for a moment call your attention to a case of carditis recently published in the 2d vol. of *Med. Chir. Trans.* p. 61., related by Mr. Featherton. This was the effect of a wound of the heart. There was no venesection at the beginning, and xxvi . only afterwards. Otherwise the patient would probably have recovered. As was to be expected from such inert and feeble practice the poor man died afterward of hemorrhage. He lived from 10 P. M. the 29th, to 11 P. M. the 31st, that is, forty-nine hours. Let us no longer send our youth to British seminaries for instruction in the art of healing. At least let them take with them the elementary principles that have been inculcated by Dr. Rush, and others who have passed their lives at the bed side of the sick; they will then travel with profit in Europe, for they will then witness a feeble inert practice, contrasted with that pursued on this side the Atlantic. I speak from what I have seen, from what I have frequently heard, and from what I read in the publications that daily come to us from Great Britain and the continent. While the British are publishing every thing that can detract from our country, we have it in our power by a simple narrative of the deaths, the diseases and the treatment pursued in them, as recorded in the history of the distinguished men of their country, to publish the severest satire upon their boasted state of medical science that could possibly be penned. If you will read the very records of the last illness of Dr. Johnson, Fox, and Pitt, you will find the most ample evidence of the truth of this observation.

LECTURE XLVI.

PHTHISIS PULMONALIS.

OUR attention will now be called to pulmonary consumption, one of the most fatal diseases to which the human body is exposed. By the term consumption, is denoted any waste of the system, or of the powers of life. It is usually restricted to three kinds, or genera. 1. Phthisis pulmonalis, or pulmonary consumption, that form of it which arises from a diseased state of the lungs, and is usually accompanied with hectic fever. 2. Tabes, or emaciation attended with hectic fever, but no cough, or other peculiar affection of the chest; but the hectic fever arises from disease of some other part of the body, as forming large abscesses, &c.; and 3d. Atrophia, which is occasioned either by defect of nourishment, or excessive discharges, but without hectic fever. In the first the body is wasted by daily fever, by an impaired state of the digestive organs, and of the functions of respiration, with excessive discharges by expectoration, by sweating, and diarrhœa. In the second, or tabes, the body is also wasted by hectic fever arising from the absorption of the matter of abscesses or ulcers in various other parts of the body, connected frequently with the obstruction of the maxillary glands usually attendant upon one of the most common causes of tabes, viz: scrofula. In the third, or atrophy, as its name imports, viz: want of nourishment, the body is not as in the two former cases, wasted by hectic fever, nor by any organic disease, but simply by emaciation, and that generally the effect of privation, or of actual abstraction of those fluids necessary to our sustenance, as large evacuations by salivation, by

hemorrhage, by sweat, by leucorrhœa, long suckling, ulcers, issues or blisters; or it may arise from a vitiated state of the humours of the body, from bad, or want of proper nourishments, as in scurvy, diabetes.

Its importance arises from its fatality. Definition.—*Corporis emaciatio et debilitas cum tussi, febre hectica et plerumque expectoratione purulenta.* These symptoms do not exist in every case. There is no emaciation in the beginning—sometimes, too, very little cough, when perhaps the disease in other respects has made some advances. Nor is there hectic fever in the commencement—even in the advanced stage it is sometimes wanting—even too, when the patient is wasted by hectic, there may be no purulent expectoration. A case is given by Fothergill of Bath, without hectic fever. De Haen, in his *Ratio Medendi*, relates another case. Dr. Gregory, too, remarks “that some have died without being hectic.” Yet he makes that expectoration combined with hectic to constitute phthisis, and says he has never been deceived by this union. I had a case under my care without hectic fever. In other cases there will be no purulent expectoration, but after death, tubercles are found; that is, numerous small vomices or collections of pus. These are solitary exceptions to the general character of the disease. Morton makes two species: 1. *Phthisis incipiens*, that is, without expectoration of pus. 2. *Confirmata* of authors. Sauvages again, divides it differently, into *sicca* and *humida*. This is not in every case just, because many cases of confirmed consumption have no expectoration, that is, it is not humid.* In my opinion, a better distinction will be into two stages, the acute and chronic; analogous to the division by Morton, into the *incipiens* and *confirmed*, acute and chronic, or active and passive. These are preferable terms, as they convey a correct idea of the nature of the inflammation attending upon the first stage of phthisis, and of the termination of such inflammation in the last stage in which either ulceration or an excessive excretion of pus

* Dr. Bayle's division into six species: 1. Tuberculous. 2. Granulous. 3. Melanosis. 4. Ulcerous. 5. Calculous. 6. Cancerous. Of 900 patients, 624 were tuberculous, 183 granuleuse, 72 with melanosis, 14 ulcerous, 4 calculous, 3 cancerous. His practice is feeble, though his book contains many valuable facts. Portal makes fourteen species, most of them drawn from the connexion of phthisis with other diseases. In Morton and Sauvages there is an endless variety.

takes place. For this reason I have thought proper to give it a place among the phlegmasiæ, instead of considering it as one of the hemorrhages in which order it is improperly placed by Dr. Cullen, he admitting at the same time that it also arises from other causes, because it is occasionally preceded by hemorrhages, but which, by the by, is only one of the numerous exciting causes of this very fatal malady, and that not the most frequent. Good, too, and Dr. Duncan have adopted this arrangement, making it a distinct genus. (Vol. 2. p. 742.)

The place I have assigned to phthisis in the nosological arrangement, I have adopted, is also calculated to lead us to more correct views of practice; for it is impossible to suppose that either an ulcer can exist in the lungs, or a purulent excretion take place from the surface without previous inflammation; it consequently leads us to look to the causes of such inflammation, and thence to the means both of preventing and of removing it. Accordingly, if we give attention to the symptoms which announce the approach of phthisis pulmonalis, and which constitute its first stage, we shall find them all of a character that denote great irritation and inflammation, and I may add, that this train of symptoms is invariably present, and characterises the first stage of phthisis. Among these, are,

1st. A cough which is dry, excited upon the slightest occasion, thereby showing increased sensibility in the lungs. This is perceived upon the least change of air, as going from a warm to a cooler apartment; from the house into the open air; upon change of dress; exposing the body to the air upon undressing for bed, or upon first getting into the bed, if the sheets be not previously warmed. Under these circumstances the patient is attacked with a paroxysm of coughing, attended with a sense of soreness and stricture of the chest, giving a sensation of tightness as if girt with a cord. A similar return of coughing takes place upon change of posture in the morning on leaving the bed; the least exposure of the body to the air in this state of the lungs renews the paroxysm of coughing.

2d. In other instances the disease announces its approach by pain—by stitches in one of the sides of the chest, or under the breast bone, extending through between the shoulders, or shooting through different parts of the chest. Upon whichever side too, the pain is felt, the patient frequently finds some difficulty in

lying upon the side so affected. But instead of severe or acute pain, in other cases the patient complains of a general soreness, and particularly a sense of rawness upon taking a full inspiration, or perhaps is unable to dilate the lungs without pain or cough.

3d. The pulse is frequent with some stricture to be perceived upon the artery.

4. The excretions are more or less generally interrupted. The tongue is dry, attended with thirst, and frequently a desire for acids. The skin is hot and dry, especially a burning and dryness in the hands and feet, with frequent unnatural circumscribed glow on the cheek and lips, while at the same time the other less sensible parts of the face will exhibit in contrast with these a preternatural paleness.

The menstruation too is diminished, and very irregular, or perhaps is totally suppressed; for all the excretions are more or less disturbed, and that in proportion to the sensibility of frame, and the degree of disease existing. While these again, particularly the menses being suppressed, produce additional irritation both in the lungs and in the whole system; and not unfrequently this fulness of the vessels of the lungs, increased by such general suppression of the accustomed secretions, frequently leads to hemoptysis and all the symptoms attendant upon active pneumonic inflammation. The patient now passes restless nights, is frequently disturbed by dreams, and labours under more or less of general fever, which is particularly increased at night; the digestive organs now become disturbed; the patient loses her appetite, complains of pain in the region of the stomach, with flatulence, and the other evidences of an imperfect digestion. As chlorosis is attended or followed by the pain of the chest, and that pain ends in inflammation of the lungs, so in this disease the pain of the chest and febrile symptoms, produce more or less derangement of the digestive organs. This train of symptoms continue a few weeks, for the disease being seated in the cellular portion of the lungs, will not announce itself with the violence attendant upon the more acute inflammation that attacks the dense membranes. Another series of symptoms now supervene, and which may be said to constitute the second stage of the disease; a degree of expectoration now begins; the patient upon each fit of coughing now begins to discharge some mucus, perhaps slightly tinged with blood. This is, in a short time, fol-

lowed by purulent matter, either yellow or of a greenish hue. In some instances this purulent matter proceeds from an actual ulceration, or destruction of the very texture of the lungs that may have taken place; in this case the breath is highly offensive, but not so, if the matter be a secretion from the inflamed surface, the texture of which is not broken. But I wish you to remember that a purulent discharge does not necessarily proceed from an ulcerated surface; the observations of De Haen, Morgagni, and the cases recorded of the dissections made by Dr. Black, the House Surgeon of the New York Hospital, which you will see in the Medical Repository, establish this fact. "An expectoration of pus," says Mr. Bedingfield, (p. 106.) "may and often does occur where there is no derangement in the structure of the lungs." Dr. Gregory, also, (see MSS. Lect.) says, in some cases there will be purulent matter from mucous membranes, but no ulcer, yet the matter will sink; but he also states cases in which mucus will sink when very viscid, and vice versa. Indeed, in a chronic catarrh we see actual pus poured out from the surface that has been inflamed, but not ulcerated. In asthma we see the same thing frequently occurring; in hooping-cough I have oftentimes witnessed the purulent discharge. The pericardium has been found distended with pus, with no ulceration of the heart or its investing membrane. (See Séance Publique de la Faculté de Med. de Paris. p. 148, read Nov. 27th, 1811.) After enteritis and dysentery, and indeed in dropsy, I have seen the same product of inflammation in which no ulceration was to be observed. The respiration now becomes hurried from the newly formed fever, for the fever now assumes a different type; the circulation is now still rapid from another cause than that existing in the first stage; it is now kept up by the presence of pus in the blood vessels, or as Dr. Gregory would say, by the inflammatory action that begets the pus; this was the Doctor's view of the proximate cause of hectic. These two conditions of inflammatory action, and the secretion and absorption of pus, are so identified, that I am very well satisfied to use either expression or opinion. I would however observe, in order to show that inflammation in itself does not beget hectic; that were this the case you would find hectic in other inflammatory diseases, where no purulent discharge attends it, whereas this is not the case. Two regular exacerbations of fever are now manifest; one at noon, continuing a few hours, and, if the patient remains out of bed, it

terminates without that discharge from the skin that usually attends the second paroxysm, that takes place at night; this ends towards morning in profuse sweats, the surface of the body being relaxed, probably the warmth of the bed promotes this tendency to sweat; and we may add, as the patient is more debilitated by the recurrence of the fever, the sweats become more profuse; the two paroxysms are also lengthened, and run into each other, when the patient can hardly be said to have an intermission. Under this exhaustion not only do we perceive a waste of the vital powers, but a general emaciation and loss of flesh; the eyes are sunken, yet apparently larger; the extremities become thin; the nails curved around the ends of the fingers; owing to the absorption of fat that before protruded the eyes, and gave fulness to the extremities; the hair, too, oftentimes falls off, from want of nourishment, as after typhus fever, the small extreme vessels that nourish it having lost their energy. But the eyes, though they are thus changed, are, as in pregnancy, remarkably clear, brilliant, and of a blue, white, or pearl colour; the blood vessels of the surface of the eye now not carrying red blood, analogous to the effects of pregnancy, the red vessels entirely disappearing. The teeth, too, are no less remarkable for their whiteness, the deposits on them being less considerable. The tongue also is uncommonly clean and moist, for the same reason. As the disease advances, more or less of a paralysis or diminished action of the absorbent system takes place, and an impaired communication between the arteries and veins—diarrhœa is the consequence. This arises from two causes; the absorbents losing their power, and frequently an obstruction or congestion of the glands of the mesentery actually interrupting the passage of the fluids from the intestines to the thoracic duct, and to the blood vessels. This excessive discharge from the bowels is a fatal symptom; not one in five hundred recovers from this symptom. Accompanying this deranged state of the digestive organs and of the intestinal canal, is the ulceration of the mouth and throat, showing itself in the form of aphthæ, and which extends itself by an erythematic inflammation, throughout the intestines, sometimes producing diarrhœa, generally a fatal symptom in this disease. Dropsy is also an attendant upon the advanced stage of phthisis, as the result of the loss of tone in the blood vessels and absorbents; sometimes a hydrothorax shows itself, in which the patient is unable to lie down;

but most usually the distant circulating vessels and the absorbents of the extremities are the first affected, producing an anasarca, particularly of the lower extremities. This is among the most alarming symptoms. At length the muscular powers are so much impaired, that the patient is unable to expectorate; the fluid effused upon the surface of the lungs remains and accumulates, the absorbents having ceased to perform their functions, and the patient being unable to eject it; the air passing and repassing through this fluid filling the bronchiæ and cells of the lungs, produces a rattling noise; the lungs lose their sensibility. In this extreme of relaxation, the discharge from the vessels is rapidly increased, even a bloody effusion frequently takes place, and instantly proves fatal. In other cases, frequently returning spasms close the scene; while in other instances, they calmly expire, without the least apparent effort or struggle, the attendants being scarcely conscious that the patient has breathed his last.

Such is the progress of this merciless enemy of the human race, which, in the language of an eloquent writer, spares neither genius, youth, or beauty, but which sweeps into the grave all that can adorn, embellish, or illuminate society. (Clinton's Discourse.)

What are the causes from whence this mortal disease proceeds?

The predisposing causes are,

1st. An hereditary vice of the constitution, such as scrofula; i. e. debility of system, more or less showing itself in the glandular system. This is exemplified in a remarkable manner in Great Britain, particularly in Scotland. This is considered one of the most common causes of tuberculous consumption.

2d. An hereditary conformation of chest, with a delicate frame of body. One uncommonly flattened, or the chest deformed with a curvature of the spine. Examples of these, predisposing to phthisis, are of daily occurrence. A family in this city has lost all their children by phthisis. The parents were brought up to habits of great labour and exertion. They enjoyed good health, possessing all the vigour that active industry is calculated to secure; but the parents becoming rich, the children were indulged in indolence, and every luxury which life can afford, or whim or fashion suggest. They have all, but a single member of this family, fallen victims to phthisis, induced by the slightest exciting causes, operating upon a susceptible and delicate frame of

body. In another family, the same disease has fallen upon the females, deriving a delicate frame of chest on the mother's side.

3d. The sanguineous temperament, characterised by a thin skin, light hair, a brilliant complexion, great delicacy of fibre, and a rapid circulation to the surface. In such a state of the system, the vessels are easily ruptured in consequence of feeble resistance. They are readily, too, affected by cold, and the other exciting causes, which are calculated to check the excretions of the system.

4th. Debility and its attendant, an excessive sensibility of system. Hence it occurs more frequently among females—hence, too, in particular families, in which that state of constitution prevails. The debility, too, occasioned by immoderate evacuations, as long suckling, especially where the children are large and the mother delicate.. In the cases of a number of ladies of this city, this cause produced pain of chest, cough, sanguineous and purulent expectoration, night sweats; yet they were all cured by weaning, and the tonic treatment.

Fluor albus, menorrhagia and hemorrhage of any sort, by the debility induced, predispose to phthisis.

Mr. Hey, in his observations on surgery, remarks that he has seen a great number of cases of pulmonary consumption, the consequence of debility, induced by violent hemorrhages, and in persons who had no apparent tendency to consumption. (p. 253.)

Debility, from the want of accustomed stimuli, has the same effect. This is a pregnant source of consumption in the State Prison. Deprived of their accustomed indulgence in animal food and spirituous drinks, exercise in the open air, and especially deprived of their liberty, phthisis is not an unfrequent consequence. The same effect is produced by the depressing passion of grief; by excessive venery; by onanism; by the debility from the intemperate indulgence in spirituous liquors.

5th. Pneumonia from cold is one of the most common sources of consumption, with or without predisposition; but more commonly where such hereditary tendency exists.—Two young ladies, my patients, who have a strong predisposition to this disease, are every autumn and winter thus affected; but by the active antiphlogistic treatment in the first stage, and the tonic plan in the second, even when the purulent discharge, tinged with blood, and

the regularly flushed cheek and night sweats have taken place, have been regularly relieved.

Measles, small-pox, syphilis—mercury, repelled eruptive diseases also predispose to pulmonary consumption. In like manner, the suppression of accustomed evacuations, as suppression of the menses, and the natural cessation of the catamenia frequently lay the foundation of pulmonary consumption.

6th. In young women the suppression of the menses is the consequence as well as the cause of phthisis. It is too justly a source of great alarm. The usual remedies, too, prescribed; viz. stimulants to restore them, are improper, and oftentimes highly injurious, the prescriber not regarding the real cause of the disease.

It is important here to distinguish between suppression, accompanied with irritation of the chest, and general febrile symptoms, and that form of suppression which is connected with dyspepsia and consequent pulmonary irritation; for in the one case, the antiphlogistic treatment is called for: whereas, in the other, iron and other tonics are indicated.

7th. A variable climate predisposes to phthisis. The eastern coast of this country, exposed to north-east winds, and great vicissitudes, and Great Britain, owing to its insular situation, and the moisture in which it is continually involved, are in a peculiar manner liable to pulmonary diseases. Holland, though a moist country, is, from its mild temperature, an exception. Dr. Cogan, who practised in Holland, states that colds and coughs are comparatively much less frequent in that country than in England. In like manner, phthisis is less prevalent in the fenny parts of Lincolnshire than in the highlands of the same county. Where agues prevail, there are few consumptions. In the interior of the United States, and on the continent of Europe, phthisis is less prevalent; and in warm climates, it is comparatively a disease of rare occurrence. Lithiasis, or calcareous deposits in the lungs, lay the foundation of this disease. A case is related by Clautrey, in Sedillot's Journal, where a piece of bone was so lodged fourteen years; and another by Holman, where one was so fixed fifteen years, (Med. Trans.) where the system was nearly wasted by this cause; but by the removal of those substances was restored. Bones, or a cent, sticking in the œsophagus, (see Good,) have, in like manner, produced a marasmus.

9th. Extraneous matters received into the lungs, are usually enumerated among the predisposing causes of phthisis. Hence millers, bakers, stone-cutters, coal-heavers, laboratory-men, scythe-grinders, chimney-sweepers, are the subjects of pulmonary consumption. In a cavern at Walshut, on the Rhine, in which mill-stones are dug and worked, a fine dust is constantly floating, that even penetrates leathern bags, and discolours money contained in them. The workmen become consumptive, insomuch that it is endemic. No one can remain twelve months there without the disease, and some are immediately affected; and that, too, notwithstanding the warm state of the air in that cavern, during winter as well as summer. (Good, vol. ii. p. 747.) Dressers of flax and feathers—those engaged in the warehouses of leather-sellers, spinners in wool, are very subject to it—hence it is so frequent in Scotland. Two reasons are to be assigned for this fact; the fine particles of wool or cotton taken into the lungs, and the waste of saliva. Knitters in wool, from their sedentary habits, persons employed in pointing needles by dry-grinding them, are subject to this disease; and it is said, rarely attain to forty years of age. (Med. Memoirs of London.)

The fumes of mercury, as you will see stated by Ramazzini, and by Dr. Francis, in his Inaugural Dissertation, and we may add, the great heat to which the workmen are exposed on such occasions. The fine dust of coal, Fordyce supposed to be one cause of its great prevalence in London; but climate, probably, has the greatest share; and we may add, the scanty and thin dresses of the fashionable females, and the heated and crowded rooms in which a change of temperature of perhaps 25° or 30° is experienced. We are sensible of the effect of these transitions upon our hands and fingers, how much greater must they be upon the exposed and tender surface of the lungs. The fumes of sulphur irritating to the lungs, as in the manufactories of the sulphuric acid, injurious to vegetation, are very frequent causes of its production.

10th. Trades and occupations—shoemakers, sitting and stooping at their stalls; writing at a desk, for the same reason. Taylors too. The exertion of the lungs in blowing musical instruments; in the case of beginners especially. The application of great heat in segar smoking. Compression of the chest by dress.

The exertions of the lungs in public speaking. Cicero himself tells us in his book on orators, that he found it necessary to retire from the forum for two years, during which he travelled into Asia; and that he there recovered his health, and returned with renewed vigour to his profession. Moliere died of hemoptysis, immediately after performing, for the fourth time, his "Malade Imaginaire." (See Vanswieten's Aph. sec. 1201. p. 49.)

LECTURE XLVII.

PHTHISIS PULMONALIS.

THE exciting or occasional causes of phthisis are numerous. A common catarrh, and especially if that is frequently repeated, ought in my opinion to stand at the head of the list of the exciting causes of pulmonary consumption; it is one of those causes, too, that attract the least attention, while it does the greatest mischief; for being seated in the mucous membrane of the bronchiæ and the cellular substance of the lungs, which are comparatively insensible, the evil becomes considerable before it calls either the attention of the patient, the parents or friends, or even the physician who has not been familiarly conversant with the fatal consequences of this disease. A catarrh neglected, either in its inflammatory or its chronic state, when there is the least predisposition to pulmonary complaints, frequently terminates in phthisis. Dr. Duncan, in his late treatise on consumption, accordingly has denominated one of his species of consumption, catarrhal consumption; his second, apostematous consumption; third, tubercular. This is a bad distinction—they run together at the bed-side, and are not to be distinguished. 2. For the same reason that a catarrh will create a determination to the chest, and congestion and inflammation in the lungs, constituting phthisis, so also will the various forms of pneumonia produce similar consequences, especially if not actively treated, and as a peculiar predisposition to phthisis exists, either from make of chest, an hereditary scrofulous habit, or any other of the predisposing causes which have been noticed. A pleurisy or peripneumony ending in empyema or vomica, not unfrequently thus terminates in phthisis; constituting the apostema of Dr. Duncan. Yet it is

to be remembered that suppuration in the lungs does not invariably or necessarily induce consumption, as some suppose. The opinion of many that the agitation of the lungs in respiration, and the constant exposure of the ulcerated lungs to the air, prevent those ulcers from healing, is certainly not correct; on the contrary, where the patient has no peculiar predisposition to this disease, nor a great previous debility of constitution, ulcers in the lungs will frequently heal as readily as in other parts of the body. 3. Tubercles are usually enumerated by writers among the exciting causes of phthisis; in my opinion they are not the causes of phthisis, but are the consequences of the previous inflammation, and constitute therefore a part of the disease, instead of being exciting causes of the disease. What are tubercles? They are usually described as small circumscribed tumors, formed in different parts of the lungs, and filled with purulent matter; as their name imports, they are small tumors (the diminutive of tuber.) But of what do they consist, and how are they constituted? In most instances they contain purulent matter, but in others none; exhibiting a mass of condensed cellular matter in the state of scirrhus. Are these, as supposed by many, enlarged and ulcerated glands? Do such glands exist in the lungs? I believe not; nor is it necessary to have recourse to a glandular structure to explain these phenomena; for we see precisely similar tubercles formed in the parenchyma of the brain, of the liver, and of the kidneys, when surcharged by inflammation and congestion, in which no small glands have yet been detected, in which as in the lungs there is nothing but cellular matter and vessels. It is, in my opinion, an union of a number of these cells in a state of congestion, that constitutes these tubercles or vomicae. If we advert to the fulness and swelling of the hands, which frequently takes place after exposure to the cold and the return to a heated atmosphere, we can easily imagine the turgid and distended condition of the distensive cellular substance of the lungs, and that during such fulness and inflammation, that they should occasionally adhere, constituting this inflamed mass, denominated tubercles, in which matter shall be effused. In some instances these tubercles or vomicae heal, the matter is absorbed, and they remain in a scirrhus state, and the patient is perfectly restored. And even when matter is formed, phthisis does not necessarily follow, any more than after a large vomica; hence the remark of Dr. Simmons, that

tubercles may exist without phthisis ; but whether tubercles be enlarged glands, or a congeries of the cells of the lungs, they necessarily imply a preceding inflammation. Hence it is that writers agree in enumerating tubercles among the most usual exciting causes of pulmonary consumption, while they do not advert to the inflammation itself that precedes and begets the tubercles. "Tubercles," says Dr. Baillie, "consist of rounded, firm, white bodies, interspersed through the substance of the lungs. They are, I believe, formed in the cellular structure which connects the air cells of the lungs together, and are not a morbid affection of glands as has frequently been imagined. There is no glandular structure in the cellular connecting membrane of the lungs; and," he adds, "on the inside of the bronchiæ and trachea where there are follicles, tubercles have never been seen." Another exciting cause of phthisis, and which, by Dr. Cullen and others, is considered as the most usual source of the disease, is hemoptysis. Such indeed is Dr. Cullen's belief on this subject, that he places phthisis under that head in his nosology—considering the two diseases as inseparable. But how stands the fact? That such rupture of a vessel in the lungs, is in some cases the immediate cause of inflammation and ulcer, terminating in a fatal consumption, is not to be questioned; but yet that it is so frequently followed by it, as some writers have represented it to be, is not true. Cases of hemoptysis in which recovery succeeded, are numerous. The late king of Prussia, according to Dr. Zimmerman, was frequently attacked with it during his seven years war; yet he lived upwards of twenty years afterwards without pulmonary consumption. Dr. Rush, of Philadelphia, frequently bled at his lungs in early life, yet lived to an advanced age, in the constant exercise of his lungs, as a public teacher of medicine in the University of Pennsylvania. His pupil, Dr. Edwards, was prescribed for by him in 1769; yet he lived till 1802—he seldom passed a year without spitting blood—yet its consequences were prevented by venesection, and the occupations of a country life.

Bleeding from the lungs indeed may be said, in some instances, I believe, to have actually prevented consumption by doing what the physician ought to have done, that is, by unloading the inflamed vessels; and indeed it may be remarked that a rupture of a vessel of the lungs is not a frequent occurrence, except where previous congestion has taken place, the effect of cold

or some other cause inducing inflammation, and has been neglected. Dr. Rush relates two cases of such recoveries, wherein the patients lost a quantity of blood from the lungs, and the Doctor very properly, I believe, ascribes their recovery to these spontaneous bleedings. I find, too, that Dr. Young remarks, in his valuable Essay on this subject, that hemoptysis in a healthy constitution is not materially formidable, and that when it appears to produce consumption, it has itself been occasioned by an incipient obstruction of a different kind. (See Good, vol. 2. p. 743; Young, p. 45.) Desault, too, says it is hemoptysis from consumption, not consumption from hemoptysis. (Ibid.) In some instances phthisis has been occasioned by other diseases as the exciting cause—as dyspepsia. Dr. Wilson Philip makes a species which he calls dyspeptic phthisis. If the irritation of the stomach will excite the lungs to coughing, it is capable of producing all the consequences of irritation. Asthma is accordingly so considered; but this operates most usually as a predisposing, instead of an exciting cause. It may, however, in some cases excite the disease by its long continuance, and the congestion of the lungs attendant upon it. A lady of this city, and another of Philadelphia, will probably both fall victims to consumption; they now suffer violent attacks of asthma, the paroxysms of which are frequently produced by change of weather, or by other causes, as violent impressions made upon the nervous system, either by mental or bodily agitation.

Scrofula is also said to be a frequent exciting, as well as predisposing cause of phthisis. Some suppose scrofula to be a disease exclusively the effect of debility, because it is attended with a debilitated state of body; while others consider it as the effect of a peculiar virus in the system. A fact which, in the opinion of some, decides this question, is that they see scrofula communicated to children by suckling, while we see nurses labouring under infinitely greater debility from other causes, giving suck and yet communicating no strumous affection to the child.

I have seen them in this way labouring under scrofula, go from child to child, and communicate the disease. In other instances the child inherits the glandular affections of scrofula from the mother thus tainted, while in other respects the mother enjoyed good health, and even vigour of constitution. The poison of syphilis also produces phthisis where there is the least predispo-

sition to pulmonary complaints. Morton states a case illustrative of this fact.

Contagion is supposed by some physicians to be the medium of communicating phthisis. Such is the belief on this subject among the physicians of the south of Europe, that phthisis is there communicated from person to person, that a law exists in some of the Venitian states, making it obligatory to burn the clothes and furniture of those who die of pulmonary consumption. (See Smith's *Tour on the Continent of Europe*.) A similar opinion was entertained of the contagious nature of consumption, by Aristotle, Galen, Morgagni, Van Swieten, and Morton, (See his *Physical Library*, Cap. 1.) Hoffman, Vogel, Desault, Darwin, and most modern writers. Dr. Heberden states that he has seen many persons die of this disease in whom contagion was the most probable cause of the disease, contracted from their constant companions or bed-fellows. Dr. Thomas states that two or three well marked cases of this nature have fallen under his observation. Dr. Rush relates the fact that this disease spread from the proprietors of an estate to the negroes, among whom it scarcely ever makes its appearance, and who were not related to the first victims, nor predisposed to phthisis. Dr. Rush related to me a case of a healthy, robust, black servant woman, in New Jersey, not in the least predisposed to the disease, who thus contracted it. It was her duty to wash the handkerchiefs of her mistress, who was ill and dying of that disease. She herself constantly receiving the warm effluvia loaded with purulent matter, in a short time became the subject of the same complaint and fell a victim to it. The matter may certainly be thus conveyed to the irritable sensitive surface of the lungs and cause the same inflammatory disease. It is also a common opinion that one person sleeping with another ill of phthisis thus contracts the same disease. It may certainly be thus communicated in the same manner as the matter of ophthalmia brought in contact with the tender surface of the eye will excite inflammation; so may it produce a similar effect upon the irritable surface of the lungs. Dr. Good remarks, (p. 165, vol. 2.) that it is not often that phthisis commences with inflammatory action!! If he had said that it is not often that it does not commence with inflammatory action, it would have been nearer the truth, and unless we say that it invariably commences in this manner, we do not tell the whole truth.

The proximate cause of this disease I consider to be an inflammation of the lungs, but not debility which makes the proximate cause of Dr. Rush, ending in either purulent excretion or an ulceration in the substance of the lungs. Let me also add that the matter contained in such ulcer or ulcers, tubercles, or vomicae, by whichever name you may please to denominate them, may be either discharged by expectoration, or may be inclosed without such discharge. Another remark is, that in case of expectoration, it may either be attended with hectic fever, or the patient may be wasted without such fever, as in the cases referred to by Fothergill and DeHaen. But in all cases, inflammation followed by a purulent secretion is essential to constitute the proximate cause of phthisis. But the pus so secreted when absorbed in considerable quantity from the lungs, as from abscesses in other parts of the body, produces the regularly formed hectic; yet it may not be absorbed, and the patient still expectorate largely; in which case the patient wastes without hectic fever. But how do we know whether the matter discharged be pus or the natural mucus of the lungs? This leads me to make a remark or two upon the distinctions which have been proposed upon this subject. In the first place, pus is opaque; mucus is comparatively transparent; pus is more friable, easily broken up by agitation with water; mucus is more viscid and tenacious, and is not easily diffused in water. Pus, that is, when warm, emits for the most part, an offensive smell—mucous has no smell. Pus has a greater specific gravity than mucus; accordingly pus sinks in water, while mucus floats. Let me, however, observe that pus, when mixed with a considerable quantity of mucus, will be suspended by the air which is usually involved in the mucus. Dr. Charles Darwin has furnished some additional chemical tests by which these two substances may be distinguished. 1st. Dissolve pus in sulphuric acid; if you add water to the solution, a precipitate is produced; but from mucus treated in the same manner, there is no precipitate. 2d. Dissolve pus and mucus in caustic alkali, and add water to the two solutions—the solution of the pus throws down a precipitate—the mucus none. Another test is, that muriated quicksilver will coagulate mucus, but will not coagulate pus.

Dr. Young, or rather Home,* has lately discovered another

* Dr. Everard Home distinguishes pus from mucus, 1. By its consistence, which he observes, is of the consistence of cream. 2. Its whitish colour. 3. Its

test by which pus is to be distinguished from mucus: that pus, like the blood, contains regular globules which are distinctly to be seen by means of a glass; but the mucus looked at in the same manner, possesses no such globules. The following is Dr. Young's own language on this subject:

"Where the greater number of the pustules are nearly equal in dimensions, a luminous object viewed through them, is surrounded by rings of colours, somewhat resembling those of the rainbow, but differently arranged, and often beautifully brilliant. The blood, a little diluted, always exhibits them in great perfection, and they afford a very accurate criterion for the distinction between pus and mucus. Mucus, containing no globules, affords no colours, while those which are exhibited by pus exactly resemble the appearance produced by the blood, the rings being usually of the same dimensions. A minute quantity of the fluid, to be examined in this manner, may be put between two small pieces of plate glass, and if we hold the glass close to the eye, and look through it at a distant candle, with a dark object behind it, as a piece of green cloth, the appearance, if the globules are present, will be so conspicuous as to leave no doubt respecting their existence." (See Young's Introduction to Med. Lit. p. 547, or Quart. Rev. for March 1813, No. 17, p. 124.) Observations on the coagulation of the blood, and on the globules of pus, compared with those of the blood. (See Royal Society's Trans. 1818, Part 1.)

DIAGNOSIS.

But there are certain diseases which bear some resemblance to phthisis. What are they, and how are they to be known?

1st. *Tussis stomachica*, a cough so denominated by Dr. Stoll of Vienna, because it proceeds from the irritations primarily seated in the digestive organs, and thence producing pain in the chest and cough sympathetically. This is to be known—1st, by the

mawkish taste. 4. Its want of smell when cold. 5. Its peculiar smell when warm. 6. Its semi-opaque globules and transparent colourless fluid when looked at through the microscope, which fluid is coagulated by the muriate of ammonia. 7. Its evaporating to dryness without coagulating. 8. Its specific gravity being greater than water. 9. Its not putrifying readily. 10. Its being not easily diffused in cold water. 11. Its being readily diffused in warm water, and then remaining so after it cools.

blueish colour of the matter discharged in the morning, and in lumps. 2d. The cough is only, or chiefly, at that time troublesome. 3d. It is accompanied with the other evidences of a disordered stomach, foul teeth, and the tongue loaded with a yellowish sordes, with a disagreeable taste, and an offensive breath. 4th. It is most troublesome, and the expectoration greatest after a hearty supper, which, remaining undigested, excites great irritation, and other signs of a disturbed state of the digestive process, that frequently bilious vomitings also attend this disturbance of the stomach. In like manner, head ache and vertigo are its occasional concomitants from the same cause. 5th. It is cured by emetics, cathartics, and tonics; and usually increased by the depleting means found most beneficial in phthisis.

2d. Chronic catarrh and tussis senilis, are nearly allied to phthisis, and sometimes terminates, in actual pulmonary consumption; but, for the most part, chronic catarrh consists in an increased secretion of viscid mucus, and is frequently removed by tonics.

3d. Asthma, especially humoral asthma, the nature of the discharge being, for the most part, mucous, and the disproportionate dyspnoea, and that returning in paroxysms, readily characterise it in most cases. But I attended a lady in this city, very subject to this disease, especially upon taking the slightest cold. In her case, every such attack of inflammation is so violent that it is followed, not by a mucous secretion, but a manifestly purulent expectoration, as much so as any I ever witnessed in phthisis; still that lady has been regularly relieved by tonics and stimulating nourishment: I mean given in its second stage, not in the first: in the first, antiphlogistic means are employed. Although she discharges pus in abundance, there is here certainly no ulceration; but I am confident phthisis will be the termination of her life, for she has a strong predisposition to the complaint, not only as inherited from her family, but as it is manifest by her own make of chest and delicate habit of body. She is now ill—in the use of emetics in nauseating doses, Dover's powder; i. e. while febrile symptoms continue—in a few days I shall give her tonics. The matter expectorated is purulent, and in immense quantities.

4th. Vomica.—The frequent chills, the preceding inflammation, dyspnoea, and the sudden discharge of the matter so accumulated, will readily characterise vomica; but this same vomica, when discharged, may leave phthisis as a consequence, especially

where predisposition exists to pulmonary disorders. In like manner,

5th. Empyema may, under similar circumstances, destroy the patient by phthisis; but in its first stage, the local affection of the side, the tumour, the dyspnœa, the preceding pleuritic inflammation, all clearly designate it.

6th. Abscess of the liver—this disease is characterised by the pain in the right hypochondrium, and shooting to the shoulder. The preceding fever is without cough, in the commencement. The sallow complexion of the patient, for the most part, readily points out this disease.

7th. Œsophagitis.—An inflammation and ulceration of the œsophagus and cardiac orifice of the stomach. Here matter is discharged by vomiting. Bayle notices the same form of phthisis in his enumeration: viz. his Melanosis.

LECTURE XLVIII.

PHTHISIS PULMONALIS.

TREATMENT—*quomodo curatur phthisis? nescio.* From the view which has been taken of the symptoms constituting the approach, as well as those marking the progress of phthisis, we are led to two indications in its treatment.

1st. During the acute or inflammatory stage, as in pneumonic inflammation in general, to cut off the determination of the blood to the chest; this is to be accomplished by the usual means of depleting the system in other inflammatory diseases, and especially by early and repeated bloodletting; its repetition is not to be directed by the buffy coat which appears on the blood drawn, for as a late and able writer observes, “in phthisis, the buffy coat appears as long as the arteries have power to propel the blood.” (See Rees. Art. Consumption. Dr. Bateman.) This fact has already been frequently noticed as occurring in other febrile diseases, as intermittents, typhus and yellow fever, in the advanced stage of which, the buffy coat appears, when it did not show itself in the first stage of those diseases; and therefore the lancet is not indicated by such appearance of the blood. The evidences derived from the quality of the blood, have also been pointed out to you, as consisting in a viscosity and redundancy of the crassamentum, the firmness with which it coagulates, and its dark colour. Your guide with regard to venesection, in the first stage of phthisis, must be the pain of the chest; while the cough continues dry and painful, or the patient experiences soreness in cough, upon taking a full inspiration, the lancet must be repeated; even although purulent matter be discharged in great quantity; although the hectic fever be regularly formed by its absorption;

although the patient be wasting by such fever and its attendant night sweats, bloodletting is to be repeated, for the removal of the inflammation which keeps up such soreness, and extends such ulceration, and continued, proportioning, however, the quantity to be drawn to the strength of the patient, and the habit of body, &c.; but at the same time other means of diminishing external action, and of diverting the inflammation from the part affected, are to be had recourse to. Dr. Dover bled fifty times in succession if not subdued. Miss —, during the first winter of her attack, was attended by Dr. Post and myself. She was relieved by venesection and other means. Bloodletting was repeated five or six times. Another winter she was attacked in a similar manner; and another physician was called upon, who declined venesection; leaving her to a milk diet, the *Lichen Islandicus*, ptisanes and glysters. In a few weeks, the case terminated, as was to be expected, fatally.

A second means of removing the inflammation constituting the first stage, is by purgative medicines, especially the saline and mercurial purges; these should be early prescribed in this disease.

3d. Another means of counteracting the excitement in the chest is by the use of emetics, especially those calculated to diminish febrile action, by their operation upon the excretions of the whole system; such are the emetics of antimony, or of ipecacuanha, or these combined; which combination has already been recommended to you, as preferable to either, separately. Full vomiting, however, should not be directed until the lancet and other means of depletion have been previously employed; otherwise, in the congestion of the lungs constituting this stage of the disease, a vessel may be readily ruptured by the operation of an emetic, and thereby greatly aggravate the complaint, instead of affording relief. Dr. Reid, as you will find upon perusing his excellent work, places an almost exclusive reliance upon emetics in phthisis; not in my opinion sufficiently availing himself of the other means of depletion, in the commencement or first stage of the disease; like those who rely exclusively upon calomel or antimony, for the cure of croup; or the Italians relying upon antimony for the cure of pneumonia; or Senac upon warm water and antimony for the cure of dysentery; nor guarding against the debilitating effects of emetics in its advanced stage. Hence, this promiscuous prescription of them has, in many instances, done

great injury. While properly employed, they are among the most beneficial means of removing general fever, and of translating the disease from the chest by counteracting inflammation. As these febrifuge effects of vomiting are desired in this stage of phthisis, let me caution you against the vitriol emetics recommended by some writers—Maryatt's dry vomit, consisting of blue vitriol and tart. emet. aa. gr. iiss.—augments the violence and distress in this disease, as in laryngitis. The same has been also adopted by Dr. Simmons, (omitting the tartarised antimony, which is the best part of it in this stage of the disease.) Dr. S. prescribes from gr. v. to gr. xv. in a wine glass full of warm water, giving the patient a tumbler of the warm water before taking it and during its operation. Dr. Senter, of Rhode Island, as you will see in his paper in the Transactions of the College of Physicians of Philadelphia, prescribes, in this disease, the following combination of blue vitriol and ipecacuanha, viz: gr. vj. blue vitriol, gr. x. to gr. xv. of ipecacuanha. I had the pleasure of a personal acquaintance with that respectable and intelligent physician; he accompanied me in my visits to the State Prison and New York Hospital, and, at his suggestion, I made trial of it in many cases of phthisis in the State Prison, and in some instances with manifestly good effects; but I did not then distinguish, as I now do, and wish you to do, the different stages of phthisis, or I should have confined myself to the nauseating and febrifuge emetics in the first stage, while I should prefer the vitriol emetics in the last, where it is frequently desirable to have the emetic effects alone, without the debilitating operation upon the whole system, analogous to their good effects in the second stage of pertussis.

4. Epispastics furnish another important mean of translating the soreness or inflammation from the lungs. Under the head of epispastics are included blisters, setons, and issues. Dr. Lettsom and Dr. Simmons prefer setons to blisters, while Dr. Mudge expresses his preference for issues, alledging, that by issues he himself was cured of this disease. If epispastics operate by the irritation they excite by the new inflammation they create in the part to which they are applied, blisters, which produce much greater irritation than either setons or issues, are certainly to be preferred. But in the last stage they are all injurious, by the debilitating discharge that attends them, and which only adds to the dis-

charges already expending the strength of the patient. In the typhus state, as Dr. Rush improperly calls it, the system is too weak to sustain the discharges of either of them. Let this class of remedies therefore be confined to the first stage of this disease, and used as early as possible; do not fear their application, however you may hesitate upon other occasions to give pain; by these applications, in delicate habits, it is kindness to do it early in this disease.

5th. Mercury, in small doses, so as to excite salivation, has been much employed in this disease; and where it has been attended with this effect upon the salivary glands, and has been given early in the disease, before the strength of the patient has been greatly reduced, it has certainly been administered with great success. Dr. Rush has recorded many instances in which it has effected cures of this disease. I have now two such cases on hand. In both, the disease exhibited many alarming symptoms of confirmed phthisis, yet both were instantly relieved when the mouth became affected. The cough, anhelation, and other pulmonary symptoms immediately disappeared. But mercury, like venesection, emetics, or other useful medicines, has been very much abused by being given in the last as well as the first stage, when it is very difficult to affect the salivary glands. To secure its effects on the mouth, it should be given in union with small quantities of opium. Mercurial ointment may also be employed as a dressing of your blister, instead of common cerate; and it may be used in the form of ointment applied upon the extremities; otherwise it proves cathartic and debilitating, without the salutary effect which it produces when it excites an inflammation of the salivary glands. Unless this effect be produced it only serves to hasten the patient to the grave. Dr. Cullen remarks of this medicine, that it is manifestly hurtful in consumption of the lungs. When it fails to excite the salivary glands, it renews and aggravates the inflammation in the lungs, and increases the purulent effusion, analogous to its effects in aggravating other inflammatory diseases, where it fails to affect the mouth.

6th. In the first stage of phthisis, antimonial medicines, or ipecacuanha, administered in small nauseating doses, are also useful, by their effects upon the skin, and the secretions in general. They should, however, be confined to the first stage; i. e. while

soreness, stricture, and other symptoms of local inflammation remain; or they may be renewed by a fresh cold and fresh inflammation, in the second stage. The antimonial wine and laudanum, or the antimonial solution, the mucilage of gum arabic and antimony or laudanum; and a small quantity of paregoric elixir, where the cough is troublesome; or the liquorice mixture, ℥ij.; antimony, ʒj.; paregoric, ʒiij.; water, ʒvj.; may be advantageously prescribed—or Dover's powder. With the same view to promote the secretion by the skin, and to relax the surface of the lungs, the warm bath has been recommended; and the steam of warm water, to be received into the lungs by means of Mudge's inhaler. They doubtless are beneficial auxiliaries.

7th. Diuretics are also depended upon by many practitioners, for their effects in diverting the inflammatory action from the chest by creating a new irritation in the system, and thereby a diversion of the fluids. (See Med. Obs. and Enq. vol. vi. p. 208.) Dr. Dixon, with this view, prescribes the nitrate of potash, and bestows upon it an high eulogium, pronouncing it equally valuable in this disease with bark in an intermittent. It may doubtless prove a valuable medicine in the first stage of phthisis, especially when produced by or accompanied with hemoptysis—in this case it will probably be most useful. Ten or fifteen grains of this medicine, with as much powder of gum arabic, or in an almond emulsion, may be given three or four times a day; but it must be cautiously persisted in, or it will greatly impair the tone of the digestive organs. Another medicine, to which great value has been attached, in the treatment of pulmonary consumption, is digitalis, or the purple fox-glove. This medicine operates as a diuretic, and by diminishing the arterial circulation, at the same time that it manifests a powerfully deleterious or sedative operation upon the brain and nervous system. Some suppose it to produce a peculiarly stimulant operation upon the absorbent system, and that by promoting absorption it enables the ulcers in phthisis to heal. If digitalis be at all serviceable in this disease, it can only be so in the first stage, and then by its sedative and diuretic operation, and thereby diminishing the general morbid excitement of the system. It operates then by lessening the increased action of the heart and arteries, and consequently diminishes the flow of blood to the lungs; and not as supposed by any specific operation upon the absorbents, for it is contrary

to all reasoning, indeed it is madness to suppose that a medicine which it is said so powerfully to diminish the action of the heart and arteries, should at the same time increase the action of the absorbents. And it is a fact, I believe very universally admitted, (see Edin. Pract. of Physic,) Dr. McGinnis's statement to the contrary notwithstanding, that in those cases in which it does not sensibly reduce the action of the sanguiferous system, it is attended with no advantage; on the contrary, that by its deleterious effect on the system it does infinite mischief.

This medicine therefore, if at all beneficial in phthisis, should only be administered in the first stage of the disease, while both the general and local inflammatory symptoms continue, and before the strength of the patient has been much impaired. Certain it is, says Dr. Thomas, in his 4th edition, that its success is proportioned to its early exhibition. But in the second stage of the disease, I know nothing which hurries the patient more rapidly to the grave, than the deleterious and debilitating effects of this poison. I have frequently prescribed it and seen it prescribed; and in many cases, contrary to my wishes, it has been given in the advanced stage of phthisis—invariably with fatal effects. Digitalis, as its name imports, is a finger-shaped flower; it is a finger which points to the grave, especially when thus indiscriminately exhibited. In the first stage it may be salutary as an auxiliary to the other means which have been directed, but then it is not to be trusted without them. Indeed, one writer, Dr. McLean, (see Thomas,) observes, "that this is all he apprehends that it will be found capable of performing;" and adds, that "those who expect wonders from it, or that it will in general cure consumption, will be disappointed." Dr. Rush, after his long experience of it, observes, I am sorry to acknowledge that in many cases in which I have prescribed, it has done no good, and in some it has done harm. Dr. Duncan, senior, in his late work on phthisis, also expresses his disappointment in the effects of this medicine, and that, too, after long and extensive experience of its effects. (Read also Bedingfield, articles consumption, p. 101, 2, 3, and Hemoptysis, p. 108.) Dr. Parr, too, very positively asserts that it is more injurious than beneficial. (Dict. vol. 2. p. 401.) But if you choose, give your patient the chance of being cured or destroyed by it. There are two modes of administering this medicine, in tincture and in decoction or infusion. The

formulæ of these you will find in all the books, in Thomas, the Dispensatory, &c. \mathcal{R} . \mathfrak{z} i. of the dried leaves, to \mathfrak{z} vij. of proof spirit; or which Dr. McLean prefers, \mathfrak{z} iv. of the fresh leaves, to \mathfrak{z} v. of the rect. sp. of wine— \mathcal{M} . Digest seven days, then strain. Begin with from x. to xv. gtt. three times a day, increasing two drops every second day. Dr. Fowler, of Stafford, uses it in decoction and infusion. For the decoction, he boils \mathfrak{z} ij. of the fresh leaves in a pint until he can strain from it \mathfrak{z} vijss. and adds the tinct. cardamom. \mathfrak{z} ss. \mathcal{M} .: giving \mathfrak{z} ss. twice, thrice or four times a day. The infusion, \mathfrak{z} i. of the dried leaves, \mathfrak{z} vij. boiling water— \mathcal{M} .; strained. Give \mathfrak{z} ss. to \mathfrak{z} vi. at a dose. We may say nearly the same thing of the prussic acid that we do of digitalis, that its debilitating and deleterious operation on the brain more than counterbalances any good that has been derived from its operation in retarding the circulation.

The diet of the patient in the first stage of phthisis, as in the more violent forms of pneumonic inflammation, should be strictly antiphlogistic—animal food and stimulating drinks of every description, should be totally proscribed. Snake-root, horehound, boneset, because they have been found useful in the second stage, have been by some directed in the first; nothing can be more improper, for if they possess active properties, this is not the occasion that calls for them. Let your patient be confined to vegetable nourishments, to milk, to fruits. Hoffman states that he has known a case of confirmed phthisis cured by confining the patient to fresh fruits, particularly strawberries in their season, and soft mucilaginous diluents, viz: barley, sago, flaxseed, bran tea, lichen islandicus. This last article as far as it contains the virtues of a bitter and tonic, which it does to a certain degree, is preferable in the second stage of this disease. Regnault directs it as a specific in this disease, and to be taken in every stage of it. Milk, if it be found to agree with the patient, may also be made use of; but with some persons it is much more difficult of digestion than even solid animal food. In that case, too, it will add to the excitement of the system, and should be prohibited; but otherwise, it is certainly a very proper article of diet, especially when diluted. Asses and woman's milk are in many parts of the world preferred to cow's milk. It is much thinner, and the coagulation from it less in quantity, and less firm than that of cow's milk or goat's milk. In a delicate stomach, therefore, they may be preferable;

but usually diluted cow's milk, especially if conjoined with lime-water, in case of acidity, agrees well with most persons. Vinegar or the acetous acid has been recommended. Yet some ascribe the disease to this as the cause. It may be of dyspeptic phthisis. A case is told by Desault, in which it was thus produced in less than a month. Galen recommends it as the cure of phthisis. Dr. Gregory, too, relates the case of a patient who recovered by taking three dozen lemons daily! The Moorish physicians also use vinegar, §vii. diluted and sweetened, every twenty-four hours; its effects are to check night sweats, and to produce costiveness.

REGIMEN.

Attend particularly to the state of the air in which your patient may be situated. Remember a warm, temperate climate, is most favourable in pulmonary complaints. On this account, if practicable, send your patient to a warm climate without delay, especially in the autumn, for the transition of the winter season always adds to the disease. If such change of climate be not practicable, your next best resource is to confine your patient to a warm room, observing to keep it at a proper temperature, say from 60 to 65°. The dress should consist of flannel or cotton shirts, worn next the skin, with sleeves; worsted drawers, socks, or stockings. And these should be frequently changed, at least twice a week.

When the second stage of this disease has arrived, attended with a copious expectoration, and all soreness and pain have been removed from the lungs, our second indication is to diminish the discharge of pus, by giving tone to the vessels of the chest, and of the system in general, and by diverting the determination which takes place to the lungs, and which still continues, to other parts of the body, and thereby to diminish the expectoration. If, however, as is sometimes the case, the purulent expectoration is accompanied with the symptoms denoting active inflammation, especially pain upon taking a full respiration, or if pain be severe upon coughing, remember the antiphlogistic treatment is still to be persisted in, viz: venesection, blisters, and antimonial diaphoretics, with dilution, as in the first stage. But when all soreness is removed, as in chronic catarrh, or abscesses after pneumonia,

our object is to change the current from the chest and to close the relaxed or diseased vessels; and that too, whether the discharges be from the surface of the lungs, or from a broken texture of the cellular portion of the lungs themselves: in either case a cure has, in many instances, been effected by active treatment.

When we see the disease of the chest diverted by pregnancy, as is oftentimes the case, and when we see it cured by mania, in other words by a new determination to the brain, as stated by Dr. Cullen; I say, when such new determination to the uterus, and to the brain, or to other parts of the body, relieves the chest labouring under phthisis, let us, as far as possible, imitate these changes by art. Upon this principle, apply stimulating plasters to the surface of the body, as the *emp. calid.*; or apply blisters, confining them however, to their stimulant effects, and not suffering the patient to be debilitated by excessive discharges. Antimonial ointment produces good effects in this case. Another means of preserving the determination to the skin, is by flannel, worn next the surface, and especially by a warm climate; and in correspondence with this principle, it is universally remarked, that patients, affected with pulmonary complaints, are relieved by the perspirable state of the surface, and the copious secretions generally, which take place during the summer season. It is also remarked, by practical observers, that tubercles are both induced and increased in the winter season, but that they are retarded and frequently removed by the warmth of summer. (See Thomas. p. 424.) Hence then it is desirable to keep the patient constantly in this temperature, either by going to a warm climate, or imitating it by creating a similar temperature in the apartments of the sick. Accordingly it has become sanctioned by the experience of every physician, that the removal of patients from northern climates to the island of Madeira, Italy, Spain, the south of France, the southern states of our own country, or to Bermuda, is attended with the most beneficial effects, provided the strength of the system be not already too much exhausted; but it is a very just observation of Dr. Fothergill, speaking of the delay of patients in changing their climate, that "it seems to be the fate of consumptive patients to do that last which they ought to have done first." (*Med. Obs. and Enq.* vol. 5. p. 369.) The island of Madeira is generally preferred to most places, as the resort of the consumptive, and very properly so, for the thermometer in win-

ter is never below 58° to 65° —nor rises in summer beyond 70° to 75° . Dr. Adams, who has written in praise of Madeira, observes that its climate is so uniformly mild, that it may be considered as a specific in that disease. The valley of Funchal, in particular, is so situated and defended by hills, excepting on the south, that it affords to the invalid complete protection against the winds to which, in the islands, in warm latitudes, he is otherwise exposed. It is no objection to Madeira as a place of resort for the consumptive, that persons are occasionally exposed to that disease in that island; for the stranger from a colder latitude will still profit by the change of temperature. But this is not all the advantage to be obtained; otherwise a warm atmosphere artificially produced at home, would be equally beneficial; but the patient has the advantage of a voyage at the same time, and the benefits of daily exercise in the warm but open air, after his arrival. But when this change is impracticable, as frequently is the case, our next best resource is to regulate the temperature of the patient's chamber, and, as far as possible, to create a West India or tropical climate at home, as recommended by Dr. Buxton, in his book on temperature.

He advises a degree of heat from 65° to 68° to be preserved in the chamber of the sick, and to be regulated by the thermometer. For this purpose the heat should be supplied by the German and Russian porcelain stove instead of that of iron. Dr. Buxton considers the iron stove as good as any other. Not so—the smell is unpleasant; the heat, too, is less regular and uniform—iron being suddenly heated and suddenly cooled, exposes the patient to those changes of temperature that ought carefully to be avoided in the sick room. This practice of making a warm climate he alleges, has been adopted with great success in various parts of Great Britain. It will also add very much to the comfort and cheerfulness of the patient, and to the purity of the air, to supply the chamber with a number of living plants. In this situation the patient can enjoy every benefit, save that of exercise, that can be obtained abroad. The next best substitute for the exercise of riding or sailing, is that of swinging, riding upon the chamber horse, or the exercise of battledoor or billiards. Swinging was introduced by Carmichael Smyth, who thought it equal to a sea voyage. Dr. Currie remarked to me, at Liverpool, at the Infirmary, where it had been faithfully

tried—that it had been of very little use—that he had never known a single instance in which it had effected a cure. I have also tried it in many cases in the State Prison, but without any perceptible benefit, and also in private practice. It has no advantage over the chamber-horse, rubbing furniture, or billiards. This is the most agreeable of all exercises; at the same time very amusing, and calculated to expand the chest. Some physicians, for this last purpose, recommend the dumb-bell—but there is objection to too much exertion of the lungs. The exercises of the gymnasium are also favourable to the expansion of the chest, and to impart vigour to the limbs, and thereby to diffuse an active circulation through the system, and to counteract any partial plethora of the chest—hence the use in the education of youth of these exercises. But in this stage of the disease the uniform exercise attendant upon a sea voyage is oftentimes more beneficial than all other remedies besides. As soon as the more violent inflammatory symptoms of the first stage have been subdued, this remedy should be recommended. How does it operate in producing these salutary effects?

In the first place, the patient breathes a milder and more equal and uniform temperature of atmosphere. Even in winter, the ice of the rigging, with which a ship leaves our port, all disappears as soon as she is off the coast.

2d. It probably operates by its effects upon the skin, promoting perspiration, which is always more abundant at sea than on land. It may also, too, in part, prove beneficial by the nausea and vomiting, which usually are produced by a first voyage, and which sensibly lessen the frequency of the circulation, and remove fever. Emetics act upon the same principle. Sailing on the Tiber was a common prescription among the Roman physicians. To these I believe the salutary effects of sailing and a sea voyage, are to be ascribed, and not as Dr. Thomas supposes, to the smell of tar, or as some others believe, to the greater purity of the air at sea than on land. This is very questionable. Next to the beneficial effects of a sea voyage, is a journey on land, to a warmer atmosphere; and to such parts of the country as are more retired from the sea-shore; for on the coast in particular, the patient is exposed to vicissitudes that are not experienced either at sea or in the interior of the country. Many persons in this city, afflicted with weak lungs, have profited, and

indeed have preserved their lives, by their annual journeys to the south, and passing their winters in South Carolina, Georgia, or Florida. Dr. Simmons, Rush, &c. all concur in this advice to the consumptive, both with the view to change of temperature, and to the beneficial effects of exercise. But exercise alone has been recommended from the days of Sydenham, in this disease. By him, riding on horseback was considered as no less beneficial in consumption of the lungs, than bark in an intermittent. But this doctrine is to be received with some limitation. It is not to be used in the first stage. In the second it has been employed oftentimes with the best effects. Stoll disagrees with Sydenham. A man in a consumption, if he mounts a horse, may ride to the banks of the Styx as certainly as if he were in a pleurisy. Stoerck brought on hemophysis and consumption by it. Dr. Hunt, a trustee of this college, was relieved of approaching phthisis, the effect of catarrh, and his life prolonged many years, by a long journey to the southern and western states.

When is it to be used?—Not in the morning, as Dickson recommends—unless in the morning he considers it hurtful! Certainly it is a great abuse of this exercise, when the lungs are sore. At the same time that exercise and exposure to the air may be proper; i. e. all active inflammation having subsided, it will also be proper, during the intermission of fever, and especially in the early part of the day, to prescribe some mild tonic, especially some of the bitters that have been recommended in the passive stage of catarrh. With this view, an infusion of columbo root, gentian, chamomile, horehound, the lichen islandicus, or even the alcornoque may be administered, and will be well calculated to close the relaxed vessels, to give tone to the whole system, and thereby to afford the patient the best chance of healing the ulcerations that may exist in the lungs.

Upon the same principle a great variety of stimulants and tonics have been directed, or rather we may say, that where such excitants have proved beneficial, it is in this stage of the disease that they have been found useful; and I may add, you will find them frequently recommended without the least attention being paid to the stage of the disease in which they ought or ought not to be directed. With this view various balsams have been recommended by Morton; in like manner myrrh, and gum ammoniac, made into a lac, and given in substance, have been pre-

scribed by Simmons, without distinguishing the stage in which they are to be administered, or in which they are to be avoided. He advises from gr. x. to gr. xxx. of myrrh to be made into bolus with honey, and given twice or three times a day. Another formula I have seen in use is the following: *℞*. Gum ammoniac, gum assafoetida aa. \mathfrak{z} ij., gum myrrh, gum camphor aa. \mathfrak{z} j., balsam Peru \mathfrak{z} j. M., syrup q. s. divided in pills lxxxiv. two to be taken every two hours. In like manner the fumes of different resins have been used; and recently, Dr. Creighton has called the attention of practitioners to the steam or fumes of boiling tar, reviving the attention that was once given to the same remedy in another form, that of tar water, so zealously recommended by the late Bishop Berkely, of Cloyne; but like every other stimulant of this nature, it can only be useful in the passive stage of phthisis, when all inflammatory action has subsided. In the Medical Commentaries you will also find a paper recommending æther inhaled by the lungs as a specific; this too has disappointed all who have reposed confidence in it. The bark by some has been highly extolled: in cases where the disease has been induced by debility, the effect of long suckling, fluor albus, dyspepsia, or menorrhagia, it has doubtless proved useful. Cases are accordingly related by Dr. Fothergill, in which it has thus proved a cure of the disease by arresting those excessive evacuations. You will find other testimony of its efficacy under similar circumstances in the first volume of the Medical Commentaries, by Chapman. Elixir of vitriol has been found of benefit in similar cases, and is oftentimes prescribed to restrain excessive sweating. The muriatic acid is also frequently recommended in France. But while soreness of the chest continues, both the bark and the mineral acids should be totally prohibited. In some cases the Virginia snake-root, and the seneka snake-root especially, taken cold, have been found useful as tonics and stimulant expectorants. Dr. Percival also attaches virtue to the sulphate of zinc as a tonic in phthisis. As an emetic in this stage of the disease, I yesterday observed that I have directed it with signal benefit in the case of J. E——'s daughter, who was cured in the advanced stage of consumption, to the surprise of all her friends. Anodynes are also very much resorted to in phthisis, but for the most part very improperly, for they smother the fire that is consuming the patient within; they debilitate the stomach, destroy the appetite, and relax the

whole system. There are, however, two cases in which they are useful in this disease: to arrest severe coughing when disproportioned to the other condition of the system, and all inflammatory action has been counteracted, and in diarrhœa. In that case the chalk mixture will be good; say, chalk ℥ij.; aq. menth. ℥ij.; aq. font. ℥iv.; laudanum ℥ij., or paregoric, ℥ss. M. a tablespoonful occasionally. But the usual prescription of opiates in catarrhal affections, attended as they usually are with inflammatory symptoms, cannot be too severely censured. Let me refer you to a very sensible letter on this subject, in which the folly of relying upon syrups and expectorants, in pulmonary complaints, has been very fully exposed. It is a letter written by the celebrated traveller Dr. Moore. (See his *Travels in Italy*.) The elder Dr. Bard made it the duty of every one of his private pupils to transcribe this letter, so sensible was he of the important instruction it conveys. Mercury, as I have before remarked, should never be employed in the second stage of phthisis. Dr. Cullen justly remarks, that it is manifestly hurtful. He should have excepted its effects in cases where it is followed by salivation, but which it is difficult to obtain in the advanced stage of phthisis; the use of mercury, therefore, should be restricted to the first stage of this disease. One word upon the diet of the patient, for in this stage of the disease the diet of the patient should receive the special attention of the physician, for much may be accomplished frequently by the nourishment that may be directed at this time.

In the inflammatory stage of phthisis, you will recollect, we enjoined the strictest abstinence; but, at this time, our object is to build up the system, and to counteract that waste which it undergoes by the discharges that now constantly expend its powers. With this view the most nutritious food is now to be directed. By this I mean such food as contains the greatest quantity of nutriment in the least compass, and which too shall produce the least temporary excitement. Yet I have seen an exception to this, in the case of Mr. C. I have seen beef-steaks with cayenne pepper made use of, and without evil consequences, even after his hemorrhage from the lungs. The best articles of nourishment in this stage of the disease are eggs, either given raw, mixed up with metheglin, or they may be taken soft-boiled, say three minutes. Rule for boiling eggs:—Put them on the fire in cold water; when

the water begins to boil, the eggs are sufficiently done, and that throughout. Or the egg may be given in custards—two, three, or four, to a quart of milk. You may now allow oysters; the testacea in general; even snails in milk; isinglass in milk, in the preparation called blanc mange. Milk is also among the best of the nutrientia; in case of heart-burn or aphthous ulcerations, it should be given with lime-water; jellies: turtle soup, mock or real. You may now allow animal food in general, particularly venison, wild fowl, done rear, so that the juices of the meat are not dissipated by the fire. In like manner, make use of vegetable nourishment abounding in mucilage; rice, boiled to a jelly; arrow root, maranta arundinacea; sago, cycas circinalis et revoluta; tapioca, jatropha manihot; rye, made into mush with milk; chocolate; lichen islandicus. Dr. Good believes the lichen cocciferus, and lichen pulmonarius, and the Pyxidatus or cup moss, have the same qualities. The effect of the Iceland moss is to allay cough and diminish fever, and like the hop, it is supposed to possess some sedative power. Willis recommends it in whooping-cough; Ströeck in hectic fever generally. You may also give malt liquors, as porter and ale; but carefully avoid wine, spices, and spirituous liquors, for they readily light up the fire, especially if it has not been perfectly extinguished. The earth-bath, or banos de tierra of Solano de Luque, has been also extolled in Spain and England among the remedies for consumption. Van Swieten tells us this is a common practice in Grenada, in Andalusia, and other parts of Spain; in England it was first made use of by the celebrated Dr. Graham, who introduced the celestial bed, into which any woman that entered was got with child. He certainly could not introduce a more popular patent into the city of London; he was accordingly very much employed in the fashionable circle; old and young all had recourse to the doctor's bed. It reminds me of a late surgeon of this city, not remarkable for his moral rectitude, though he stood well with the ladies, that he never had any difficulty in curing dysmenorrhœa, and in removing barrenness in those ladies who would place themselves under his prescriptions. But with regard to the earth-bath, I would only remark of it that it is but a little anticipation of what the patient may soon expect to take place, if this prescription be persisted in. Van Swieten however, approves of it, and it has been since recommended by Dr. Simmons and by Pouteau. Dr. Beddoes in-

roduced a new theory, that consumption of the lungs consisted in and was kept up by an excessive quantity of oxygen, and that the disease was to be removed by abstracting a portion of the oxygen. Various gases were accordingly prepared, and in some cases the patients were sent to the vats of the breweries, to respire an air abounding in carbonic acid gas. With the same view, in Holland and Germany, it has also been fashionable of late to put the patient in a horse or cow stable, for the purpose of breathing an air that contains less of that stimulant ingredient oxygen, or rather which contains more carbon; for by respiration, the air, having lost a portion of its oxygen, is reduced to the state of hydrocarbonate. With the same view it has been recommended to ladies to make bed-fellows of their dogs and their cats. During the existence of this delusion, I occasionally met with patients desirous of an experiment. Matrimony, we well know, especially when pregnancy follows, has changed the current very successfully in this disease; so also has mania, and probably upon the same principle, cured phthisis. Mineral waters, too, are frequently resorted to in this disease. Those abounding in iron are occasionally useful in the second stage, as tonics, except in cases of hemoptysis, or those in which a tendency to it exists; in the first stage they are totally to be prohibited; in the second, at proper seasons of the year I have recommended my patients to visit Ballston; the journey and agreeable society are sometimes beneficial, but the waters should be cautiously directed in this disease. Such cautions I have pointed out in a paper on that subject and Ballston water. (See Register. See also my Appendix to Thomas, new edition. See also my Essays.)

LECTURE XLIX.

CYNANCHE TONSILLARIS—VEL TONSILLITIS.

WE now enter upon the consideration of the various forms of cynanche, so denominated from the sharp coughing and sense of strangling that attend upon these affections of the throat.

Cynanche is a term composed of two words having a reference to these effects, viz. *κυν*, a dog, (the acute cough bearing some resemblance to the barking of that animal,) and the verb *αγγω*, to strangle. The first we shall notice is the cynanche tonsillaris, or tonsillitis, as it may more properly be called. Dr. Cullen's definition is as follows: "Cynanche tonsillaris membranam faucium mucosam, et precipue tonsillas, tumore, et rubore afficiens cum febre synocha." He should have added to this what he has added to his definition of cynanche in general, viz. dolor faucium; deglutitia difficilis, cum angustia in faucibus sensu; for these last mentioned symptoms are more characteristic of this form of cynanche than any others; in some of them they are wanting altogether; indeed it is a remarkable circumstance attendant on croup, that it is attended with no difficulty of swallowing. But in another particular Dr. Cullen is not sufficiently explicit, when he confines this inflammation to the mucous membrane, for cynanche tonsillaris, when it is thus locally confined not only affects the mucous membrane, but the very substance of the tonsils themselves, and not unfrequently ends in abscesses, and sometimes sphacelus of those organs; first affecting one of them, afterwards the other, and in some cases the tumor is so great that the tonsils meet, insomuch that you see nothing of the uvula. But the inflammation is not confined to the tonsils, it extends also to the velum pendulum palati, involving the muscles of the

pharynx, the constrictor isthmi faucium, and the uvula, which is elongated, irritates the muscle just before mentioned, producing a continued effort to swallow, and attended in some instances with very acute distress. The tumor of the tonsils is sometimes so great that it becomes perceptible to the eye externally; in all cases they are to be felt in the throat, adjoining the angles of the lower jaw. Sometimes, too, the inflammation spreads itself into the pharynx and œsophagus; it is then more dangerous; in other cases it extends through the eustachian tube even to the ear, affecting that organ not only with severe pain but deafness. When it is thus extensive it goes still further; the muscles upon the whole side of the head become affected, and are especially painful upon motion; the eyes, the face, the ears, all partake of a general fulness and sense of soreness; the external muscles of the head and neck become so much affected that it is difficult and distressing even to turn the head upon the shoulders; the whole system becomes more or less affected; and, indeed, from the commencement the symptoms of general irritation show themselves in connexion with the local affections of the throat; the patient is affected with chills; an excited pulse, which is both frequent and hard, though less so than in many other inflammations which are situated in more dense membranes; the tongue is furred and white, attended with great thirst and sliminess about the mouth, and a general interruption, I may say, to all the excretions. This disease attacks most frequently those who are full habited and of nervous temperament; that is, such as have abundant secretions flowing, and great sensibility to those causes which will shut them up. For the same reason females are more subject to this disease than males, and children more than adults. Like the other phlegmasiæ it is most prevalent in autumn, spring, and winter; but it rarely occurs in the summer season, except where a person much heated may be exposed to a stream of air; it is also more prevalent in moist situations, and on the seaboard where the vicissitudes of weather are most frequent and most severe. The natural termination of this disease, as it is seated in a secreting surface, is most usually by resolution; sometimes it affects the cellular matter of the tonsil, and proceeds to suppuration; it rarely ends in gangrene, never in scirrhus, but it is apt to leave a very turgid and permanently enlarged state of the tonsils, and which indeed sometimes calls for removal by the

knife or ligature; but this enlargement only occurs after very repeated attacks, and after gross neglect either on the part of the patient in not early applying for medical advice, or temporising feeble practice in the doctor, when he may be called upon to prescribe. The predisposing causes are 1st. a relaxed full habit of body. Hence plethoric females who live a sedentary life, and perhaps confined to a warm room, are most susceptible of this disease when exposed to cold; 2d. the practice of foot-bathing in warm water; 3d. the relaxation of the throat by the use of mercury also prepares the patient to become readily affected by cold; 4th. keeping the neck very warm by much covering is another cause well calculated to invite an attack; 5th. the debility of the parts by a former attack renders such person very liable to a renewal of the disease upon the least exposure to the usual exciting causes. Mrs. T. every year suffers a severe attack, and which for the most part ends in abscess. A daughter of Gen. M. in like manner is very subject to the same disease, and which, too, usually proceeds to suppuration; that is, the whole tonsil, as well as its mucous membrane is equally susceptible of inflammation; and hence too, you will find, that those who once have the suppurating sore-throat become very subject not only to this disease, but to this very termination of it upon every attack.

The exciting causes are cold, changes from a hot room to the cold air. I have had repeated attacks of sore throat after visiting the hot-house at the botanic garden. Change of dress; a partial stream of air.

In the treatment of this disease, we should be governed by its different stages. In the 1st. or forming stage, the indication is to restore the excretions, which are diminished; especially those of the tonsils and fauces. An emetic at this period, as in croup, is particularly useful, and will frequently, in a few hours, put a period to the disease, especially in children, whose secretions are easily unlocked by the relaxing effects of nausea and vomiting, especially in the first stage of the disease. In the full habit of body, and in old age, they must be given with caution, and not until venesection and a purge have been administered. But where no remarkable fulness or determination to the brain forbids their use, they will be employed with the best effect. This practice but ill accords with that recommended by Dr. Cullen, and Thomas, and Good, who prescribe without discrimination, as to the stage

of the disease, the use of an astringent gargle, consisting of oak bark and alum; an infusion of rose leaves and elix. vitriol—acid and astringent gargles.

But, 2d. When inflammation is actually formed, the tumour of the parts considerable and increasing, the patient, too, of a full habit of body, your indication is by every means in your power to cut off the supply of blood to the part. This is to be effected by large and repeated bloodletting; the blood should be drawn, too, from a large orifice, so as at the same time to relax the system as much as possible, by the suddenness with which it is drawn, as well as quantity. Local bloodletting, by the lancet or scarificator, or by leeches, should also be employed, especially in those cases where it usually proceeds to suppurate. Cathartics, calomel and jalap; or calomel alone, which is preferable; glauher salts; antimonials; cream of tartar; sp. mind.; calomel and antimony. Liniment to the throat, composed of two parts aq. ammon., one of oil. Blisters to the throat, if the swelling is considerable, are also useful by translating the irritation to the surface. Warm bathing and foot-bathing, will also contribute to promote the effects of these medicines upon the excretions. The steam of warm water and vinegar may also be applied to the throat. But let me advise you to avoid the common but improper practice of gargling in the first stage—it aggravates the inflammation by the exertion of the muscles of the throat employed in that process. When actual ulcers are formed gargling is necessary; and it is probable that the use of it in this state of the throat, has led many to employ it in the first stage, misled by the exudations of lymph or mucus which appear in that stage, and which many persons, unacquainted with the nature of it, consider to be real ulcers; whereas, they are the mere effusion of the viscid matter from the inflamed vessels. But when this disease may be proceeding to suppuration, and this is unavoidable, a gargle may then be used with advantage. That which is usually employed, consists of sage tea, vinegar and honey—a gargle of an infusion of hops, or of barley-water ℞i.; and sal ammoniac, ℥ij. But that which I have directed with most benefit, and which I have found best calculated to hasten the suppurative process, is a strong decoction of figs, aided by a large bread and milk poultice, or a hop poultice, applied to the throat.

But, 3d. When suppuration has taken place, discharge the

matter as soon as possible; for the parts are of so lax a texture, that the tumor will remain stationary, or perhaps go on to increase for several days, if not relieved by the lancet or scarificator. Should the patient be very much irritated, and altogether unable to swallow nourishment, it must, in this case, be administered by the bowels; for this purpose, injections of soup or milk, or milk-punch, gruel, sage, &c. should be thrown up twice or three times a day, to secure their retention. But the patient is not only affected with difficulty of swallowing, but also of breathing. Bronchotomy, however, can never be necessary in this disease; yet you find it recommended by Thomas, and to be early performed. Dr. Cullen, in his long practice, never had occasion to see a case of this disease requiring this operation; nor will you, probably, ever meet with one—I have met with none.

4th. In some instances, you are not called upon in the first stage of the disease; and instead of the terminations we have mentioned, the disease has ended in ulcerations of the throat. I mean those usually attendant upon cynanche maligna, exhibiting a livid ash colour, attended with a very offensive fœtor. In that case, a gargle of yeast, water, and honey, with the addition of borax, or vinegar, water, and honey, should be employed. But this termination we shall have occasion to notice more particularly when speaking of cynanche maligna.

In the passive stage of the tonsils, use gargles of port wine, the decoction of oak bark and alum; oak bark with vitriolic acid, or muriatic acid—scarifications should there be tumors of the tonsils.

The diet should be abstemious in the first stage, as in the active stage of the phlegmasiæ in general.

Drinks.—Barley-water; teas; toast-water; fruits in water; currant-jelly; apple-water, &c., until inflammation be removed—then better food, adapted to the degree of debility; another condition of body must be directed, to prevent a return of the disease. Let your patient be directed to abandon the practice of bathing the feet with warm water, for the feet are thereby made doubly sensible to cold, and in this way, I believe, sore throat is frequently induced. Another inconvenience attendant upon this practice, is that the feet and legs are thereby rendered very cold; and indeed, in some instances, it is an actual source of distress, depriving persons so affected of their sleep. When called upon to prescribe for cold feet and limbs, as you will be, recommend

the practice of washing the limbs with a napkin, dipped in cold water; and afterward diligently rubbing them with a coarse cloth. A glow instantly follows. Let them avoid also the practice of inclosing the throat with much flannel, or the fashionable poultices of cotton, or those made up of the doubling of several neckcloths; for those warm coverings of the throat, by the relaxation they occasion, render those parts much more liable to inflammation than they otherwise would be. On the contrary, a more free exposure of the neck, and the daily practice of washing the throat, internally and externally, with cold water, I believe affords the best security against the returns of this disease.

The removal of the tonsils by the knife is preferable to ligatures or wires. There is no necessity for the delay of removing them by wires. There are no vessels of much importance to be divided. (See Paper by Alex. E. Hosack, in the Med. Journal of Philadelphia,) who was the first in this country to remove them by the knife. He has done it six times, and no hemorrhage has followed.

LECTURE L.

CYNANCHE MALIGNA.

CYNANCHE MALIGNA, the putrid or ulcerous sore throat. This is a much more formidable disease than the preceding, and calls for your particular attention, inasmuch as the more malignant symptoms which characterize it frequently appear very early in the disease. Dr. Cullen defines the disease as follows: "*Tonsillas et membranam faucium mucosam afficiens, tumore, rubore, et crustis mucosis coloris albescentis vel cineritii, serpentibus, et ulcere tegentibus; cum febre typhode et exanthematicis.*" That it affects the tonsils and mucous membrane of the fauces with tumor, redness, and mucous crusts, of a whitish or ash colour, spreading or covering ulcers, attended with a typhoid fever, and with exanthemata, i. e. with more or less of a rash upon the body, assuming frequently the appearance of petechiæ. The symptoms in the very commencement of this disease are very similar to those of the cynanche tonsillaris; the first stage of excitement however, is but of short duration, yet it is much more severe; the operation of the poison is such upon the nervous system, that it very soon prostrates the vital powers: analogous to some other contagious disease, it in some cases affects the vital functions, from the very commencement of the disease, manifesting itself in a feeble circulation, and great anxiety and depression of spirits. For the most part the symptoms which more immediately designate the malignity of the disease, do not disclose themselves until two or three days have elapsed; then the ash coloured spots appear on the throat, attended with fœtor and other evidences of a typhoid state of the whole system; yet in some instances I have

seen these very symptoms show themselves in the first twenty-four hours, and prove fatal upon the second day of the disease. The poison of the disease, before the fever is excited, has been operating both upon the fluids and upon the nervous system, producing a change in the condition of the former, and by its deleterious operation, analogous to other poisons, prostrating the powers of the latter.

Hence you see the dark purple, crimson, or lurid colour of the throat, the ash coloured exudation, the foul spreading ulcer, followed by the early gangrene and sloughs of the tonsils, with an offensive breath. Hence, too, the hemorrhages from different parts of the body—hemorrhages from the nose, from the throat, tongue, lips, blistered surfaces, bowels; the petechiæ,* the blotches, the offensive excretions, the discoloured tongue, teeth and lips, that characterise the progress of this complaint. From the same causes you are led to explain the early debility, anxiety, and depression, and the small and fluttering pulse, and indeed, which is feeble almost from the commencement. In some instances the inflammation and ulcer spread themselves to the neighbouring organs, affecting the eustachian tube, and even destroying the texture of the ear and the powers of hearing. Sometimes the parotid and the chain of glands situated on the neck partake of the disease; but in other instances a still more formidable extension of disease shows itself; that is, the acrid matter and ulceration affect the roof of the mouth, the palate, the pharynx, œsophagus, and stomach, and ends in a disorder of the bowels and a fatal diarrhœa. In other instances again, the same peculiar inflammation and ulcer travel down the trachea, producing symptomatic croup, or cynanche trachealis. (See Dr. Bard's excellent Dissertation on this disease as it prevailed in this city many years since. *Am. Phil. Trans.*) Dr. Cullen refers to this dissertation in his nosology, under the head of cynanche maligna, which is its proper place; the symptoms of croup being not primary, but symptomatic.

This disease terminates its course usually in about five or six

* The rash that frequently attends a typhoid state of body, and which appears in this species of cynanche, has led to the question so much and so violently agitated, whether this malignant form of cynanche be not scarlatina anginosa—whereas they are as distinct from each other as the malignant yellow fever from the common domestic bilious remittents of the United States.

days; in that time it either proves fatal, or the patient is convalescent. There is, therefore, no time to be lost, and it calls not only for all your activity, but all your powers of discrimination.

CAUSES.

Sometimes this disease is a continuation of cynanche tonsillaris long protracted. This is a rare occurrence, and is seen only when a certain condition of atmosphere has been favourable to such malignancy; but from whatever cause it may have originated, it is afterwards propagated by contagion, and in its characters, bears the same relation to cynanche tonsillaris, that influenza does to catarrh from cold, and peripneumonia typhodes to inflammatory pneumony, dysentery to simple enteritis, or contagious puerperal fever to simple hysteritis.

The treatment of this disease should be active in proportion to its malignancy, and the rapidity with which it passes through its various stages. Its first stage of excitement, as before remarked, is short, but frequently equivocal, not decidedly or exclusively inflammatory, but frequently showing its peculiar malignancy very early. The means of reducing the excitement must therefore be had recourse to with a cautious hand. Venesection must either be omitted altogether, or only employed under peculiar circumstances, as in a full athletic habit, and when the inflammatory symptoms are more strongly marked than in ordinary circumstances; it is accordingly very rarely called for, and is generally considered as a fatal practice. In ulcerous sore-throat the same caution is necessary in the use of purgatives; for even where spontaneous purging appears early in the disease, it is considered as a dangerous symptom; the milder cathartics and enemata are therefore usually recommended, and have been highly extolled in this disease. Calomel was employed on Long Island with the greatest success in this disease, before the American Revolution, by the late Dr. Ogden; by him I believe it was originally introduced. The introduction of this treatment is however due to our own country. It was given in large and repeated doses, and usually conjoined with opium, to secure its general effects upon the system and to prevent its too free operation upon the bowels. Emetics are also important remedies in the commencement of this disease. By their effects on the excretions gene-

rally, and thereby their alterative operation upon the whole system, they take off much of the violence of the complaint, and save the vital functions from injury. Sudorifics, viz. wine whey, snake root, or sage tea, warm bathing, fomentations, for the same reason, are useful, and are accordingly indicated, after the use of emetics and purgatives, but they should be of the stimulant kind, not even antimonial or spirit. mind. Blisters, too, are of doubtful efficacy, and should only be employed in the very first stage of the disease, and then only for the relief of particular symptoms, especially for the relief of the throat; as general febrifuge remedies, they are certainly dangerous applications in cynanche maligna. Besides the use of snake root and wine whey, the general tone of the system must be preserved, by the early use of bark,* and wine, and porter, with the best vegetable nourishments, as sago, arrowroot, panada. Remember, as in typhus fever, animal food should be totally proscribed; for the same reasons that vegetable diet is called for, the patient may take moderately of the acid fruits, especially fresh fruits, duly guarding however against their purgative effects. What local remedies shall be made use of to diminish the inflammation and tendency to gangrene, and afterwards to remove the sloughs which may form, and to excite the parts to a healthy action? In the first stage make use of a gargle of vinegar, water, and honey, or rather let the patient inhale the steam or vapour of these ingredients from Mudge's inhaler, or from the inverted funnel. When the ash-coloured crusts and ulcers appear, or the dark crimson colour, threatening gangrene or sphacelus, manifests itself, the yeast gargle, with an addition of borax and honey, is preferable. Others, however, prefer a decoction of the bark, with the addition of myrrh and the muriatic acid. Reich's prescription is now useful, viz: *R.* decoct. cort. Peruv. ℥vj. ; muriatic acid ℥i. ; tinct. myrrh. ℥i. ; tinct. aromatic ℥ss. M.; to be used as a gargle. Some again make use of port wine, others of brandy and water, as a gargle; some touch the parts with a solution of the white vitriol; others use the blue;† while others again prefer the

* When children are the subjects of cynanche maligna, and you may find difficulty in giving the bark, it should be administered by injection, and which should be had recourse to the moment the first excitement is diminished.

† When hemorrhage takes place from the throat, the sulphate of copper is certainly a necessary prescription, or the Ruspini's styptic may be employed, which has vitriol as its base, at least its most active ingredient.

acetate of copper, in the form of the mel. Egyptiacum of the dispensatory. The late Dr. Anderson, a very eminent physician from the island of Jamaica, when on a visit to this city before his return to Europe, informed me that it had become the most generally approved practice in the West Indies, to make use of the cayenne pepper in the form of a gargle, as well as internally, and that it effected a change in the state of those ulcerated surfaces more readily than any other means he had ever seen prescribed. The following is the formula I received from him: Two table-spoons full of the small red pepper, or three of the common; two tea-spoons full of salt; mix into a paste; add ℥viiij. of vinegar and ℥viij. of boiling water; of this they also gave the patient one table-spoonful every half-hour, besides making use of it as a gargle to the throat. But this, I find, is the prescription of Mr. Stewart, who first introduced the use of this medicine in cynanche maligna. (See Med. Commentaries, 12th vol.) Dr. Thomas also states, that he has used it with success in his practice while resident in the West Indies. But, as I said before, my chief dependence is upon the yeast, borax, and honey, as my local application, with a solution of the sulphate of copper, or lunar caustic, occasionally to touch the parts before using the yeast gargle. In children, cleanse the throat by a piece of sponge, attached to a small piece of stick or whalebone, or the common swab of linen. This is necessary, as the children swallow this acrid matter, and it renders the disease more dangerous; the greater fatality of this disease in children is partly ascribed to this circumstance. As this is a contagious disease, be careful to separate the well from the sick; and in the sick room make use of every means of diluting the atmosphere, and of correcting any vitiation that may have been produced by want of cleanliness. The antiseptic fumigations, by means of the sulphuric, the nitrous, the muriatic, or the acetous acids, are now called for; in a word, the same treatment as in typhus should be pursued.

LECTURE LI.

PERITONITIS.

INFLAMMATION of the membrane lining the abdominal cavity, and covering the abdominal viscera, so denominated from *περι-τείνω*, to extend around. Dr. Cullen defines it thus: "Pyrexia; dolor abdominis, corpore erecto acutus; absque propriis aliarum phlegmasiarum abdominalium signis." This disease is rarely so confined; yet it certainly, in some instances, originates in the peritoneum, as from wounds; and in a case under my care, it arose from cold; but for the most part when so originating, unless it be soon relieved, it extends to the neighbouring organs, affecting the stomach, intestines, omentum, the mesentery, &c. Dr. Cullen distinguishes it into three species, the 1. propria,* 2. omental, and 3. mesenterica. This distinction it is impossible for us to adopt, and it is altogether useless. If any species be made, take in all the abdominal viscera, and not merely the omentum and mesentery, for the other viscera are all just as likely to become affected as those noticed by Dr. Cullen. But who can distinguish them? and what practical good can it lead to? If any division be made with this view, let it be into idiopathic and symptomatic. Such a distinction I have adopted; for it may be observed that not only the inflammation when originally or primarily seated in the peritoneum (from whatever cause) readily

* Affecting the peritoneum, strictly so called, or lining of the belly within, as distinct from those extensions of it that involve the different viscera. Cullen himself, observes, that it is difficult to say by what symptoms they are to be known, and that when known, they require but the remedies for inflammation in general. These species, therefore, should not have been in Cullen's nosology.

extends to the different viscera; but, vice versa, any of the abdominal viscera being in an inflamed state, the peritoneum soon partakes of it, more especially if it begins in the uterus, in which, on account of its great sensibility, the inflammation is rapid, violent, and readily involves the neighbouring organs. In some cases it appears as a general soreness, not referring to any particular organ, and though sometimes it occurs after delivery, the uterus is not always the part first affected, even though the labour may have been violent, tedious, and mismanaged; though the patient in the course of labour may have been excited by heating spirituous drinks, or the subsequent application of cold; the peritoneum and not the uterus, even in this case, may be the primary seat of disease. I have, therefore, given it a distinct place from an inflammation of the womb, or puerperal fever. In the case, too, above referred to as arising from cold, it preserved its appropriate character as distinct from gastritis or enteritis. In that case it arose from change of clothes—the hot air of the assembly room after exposure to cold, and perhaps his wine and whiskey punch as well as the exercise of dancing, may have had their agency in giving a preternatural excitement to the system. Seeing, then, that this disease has its peculiar character and its appropriate symptoms, I have given it a distinct place in our arrangement. The symptoms are, chills, soreness of the abdomen, soon becoming acute, the very weight of the bed-clothes becomes painful, followed by pure unmixed synochal fever; pulse small, corded, and frequent, “sometimes perfectly natural, in others strong and full, as in pneumonia; again, in others, small, feeble, fluttering, and almost imperceptible.” (Bedingfield, p. 211.) Respiration corresponds with it; heat for the most part increased, excepting perhaps the extremities; tongue white and furred; countenance pale; the blood being determined to the membrane the more immediate seat of the disease, and probably to the viscera of the abdominal cavity generally. The patient lies on his back, his lower extremities drawn up to relax the peritoneum; in that situation, too, the viscera are less pressed upon, and they occasion least irritation to the inflamed membrane; great swelling of the abdomen manifests itself, especially in puerperal cases of peritonitis. The stomach and bowels, in some cases, soon partake of the inflammation; the stomach becomes irritable, excessive vom-

iting comes on, and that oftentimes bilious, owing to the great determination to the abdominal viscera. For the most part, costiveness and spasms of the intestines; but sometimes diarrhoea is the effect of the great biliary discharge into the intestines; for the intestines are not now affected with stricture as when they are the original seat of inflammation. The bladder also, is irritated, and contracts, frequently; small quantities of high coloured urine are discharged, the kidneys, like the liver, having an inordinate current of blood running through them. It is a general remark, that very high coloured urine is always, or very generally, attended with increased inclination to pass it, and even in small quantities, because it is more acrid. It comparatively partakes of the blood from whence it has been separated, and abounds in all the saline properties of the blood itself. You will recollect that as it regards the blood, an error loci always affects the parts in which such blood may be effused. The blood effused in the lungs produces violent coughing—in the uterus, excites to contraction and pain—blood poured into the stomach produces vomiting—in the intestines, diarrhoea—in the gall bladder, excites vomiting and purging—in the bladder, a propensity to micturition. The swelling of the abdomen increasing, it becomes more painful; respiration becomes oppressed by the tumour necessarily pressing up the diaphragm, the secretions are all checked; the pulse increased to 120 or 130. In a few days, nay, in a few hours, if not relieved, a total and sudden cessation of pain follows; the swelling of the belly increases; the countenance becomes livid; the extremities become cold; profuse sweats follow, all showing sphacelus to have taken place—involuntary evacuations by stool and urine take place. The vital principle is sensibly impaired, showing its loss in delirium and convulsions, which are soon followed by dissolution. Upon examining the body after death the same swelling which had appeared a few hours before dissolution is now suddenly augmented—the abdomen is now inordinately distended and tense as a drum, and upon opening into the cavity of the belly there is a sudden extraction of a gas, foetid and offensive in the extreme. Upon exposing the viscera, a large purulent and serous effusion is found floating over the surface; exudations of newly formed gelatinous matter having the appearance of membranes appear to glue the viscera together, they are frequently

found adhering to each other, showing a highly injected state of the vessels; in some portions displaying the gorged condition of parts constituting gangrene and in others the total decomposition called sphacelus.

But again, when the patient has been actively treated in the commencement of the disease, and experiences relief from the urgent symptoms, and evidences of a favourable termination of the disease show themselves, they are the following: the pulse becomes full and soft; the tongue moist; the respiration natural; the belly soft and without pain on pressure; the milk and lochia are restored; the skin moist and warm; the excretions in general are restored and natural, with a return of blood to the face and extremities; blistered surfaces assume a healthy red colour; the sleep is natural and refreshing; the mind tranquil and composed. The predisposing causes are a sanguine habit of body, and distension of the belly by pregnancy or by dropsy. The exciting causes are cold suddenly suppressing the excretions; injuries during parturition; a lingering labour; exciting drinks during parturition, or immediately after child-birth; the wound in tapping for dropsy, or in the operation for hernia, or for aneurism; the operation for hydrocele sometimes excites peritoneal inflammation: in like manner a mismanaged inflammation of the testis sometimes extends to the peritoneum. The excitement of fever is, in some cases, thrown in upon the belly, by check of perspiration, and produces peritoneal inflammation.

TREATMENT.

Venesection should be used until the pulse rises. The physician should not be deceived or deterred by the small pulse and paleness of countenance. There is related a case by Beddingfield in which two hundred and forty ounces were drawn before the patient was relieved, besides covering the abdomen with leeches, his general practice. Emetics large and repeated should be given; the warm bath, general and partial, should be used, with fomentations of vinegar and water to the belly; but after the application of a blister to the belly, fomentations should

be applied to the extremities. Saline cathartics should be freely administered, as also small doses of calomel and antimony, unless the stomach be disturbed. The Dover's powder may in some cases be called for. Repeat the enemata frequently. Let the drinks be gruel, toast-water, barley-water, gum arabic, milk and water.

LECTURE LII.

GASTRITIS.

GASTRITIS, or inflammation of the stomach, so called, from γαστήρ, the stomach. Dr. Cullen calls it a "pyrexia typhodes." Why is it so called? Is it because the pulse is small? or from its tendency to sphacelus? or on account of the nervous affections, the prostration and rapid exhaustion which so soon supervene? This last is most probable. The remainder of Dr. Cullen's definition runs thus: "*anxietas in epigastrio, ardor et dolor, ingestis quibuslibet auctus; vomendi cupiditas, et ingesta protinus rejecta; singulus.*" I have divided it into idiopathic and symptomatic; that is, the first primarily appearing and originating in the stomach; the second communicated to the stomach after appearing in other parts either of the intestinal canal, or in some of the adjacent viscera, or as symptomatic of fevers. Thus we see it to be symptomatic of aphthæ, of peritonitis, enteritis, hepatitis, hysteritis; symptomatic of yellow fever and of the suppression of small pox. These two species may each also be subdivided in the manner Dr. Cullen has divided it, into inflammation of the phlegmonoid kind, involving all the coats of the stomach, and of the erythematic, in which the inflammation is confined to the nervous or villous coat of the stomach, and is attended with milder symptoms, in all respects such as we see frequently to succeed to aphthæ and erysipale tous affections of the fauces, or derangement of the digestive powers of the stomach, attended with fermentation and a predominant acidity, or a slight degree of fever, &c. Dr. Cullen very properly associates the soreness of the mouth with the affections of the stomach. In this erythematic form of

gastritis the fever and pain are both moderate, the last not increased upon pressure: on the contrary in the phlegmonoid gastritis, in which all the coats are affected, the fever and pain are both much more violent. Dr. Cullen, in a note, remarks that this is a just distinction, yet sometimes difficult to be discerned. I have frequently seen them both. I have seen it attendant upon phthisis, beginning with aphthæ in the mouth and fauces, and subsequently affecting the œsophagus and stomach. In like manner it sometimes succeeds to the inflammation in the mouth from teething. (See paper by Dr. Trenor in the Medical and Physical Journal of New York.) I have also seen it as attendant upon, and the sequela of yellow fever, but in which it was confined to the nervous coat of the stomach, or its mucous lining. This distinction is to be made with great caution, especially as it regards practice; in cases of doubtful character we had better err in too active treatment where there is no danger, than by too passive conduct where there is. The symptoms, more especially in the phlegmonoid form, are—the pulse small, frequent, and corded; the tongue white and furred; great pain, especially on pressure, with a sense of burning; great distress; severe spasms, and sometimes convulsions. In some cases I have seen the disease attended with involuntary efforts to bite the by-stander, or any thing near, as the cup or glass in which his drink is offered him, exhibiting all the fury of perfect hydrophobia. I once saw a case in which the disease was induced by drinking cold water when heated. So severe were the spasms of the poor man that he crushed the tumbler in which his drinks were presented to him. Such is the sensibility of the stomach, derived from its numerous nerves, and the great semilunar ganglion, that all these violent symptoms are to be expected. Nor are they so confined; the irritation extends to the sensorium, producing the symptoms of an inflamed brain. I have seen several cases of persons arriving in this city poisoned by eating fish caught on the copper banks. Ten or twelve were so severely affected, that Dr. Bayley, after the death of one or two of them, examined the head, looking for inflammation; so intimate is the connexion between the head and stomach. I am not surprised at the error of Clutterbuck in ascribing so much to the brain as he has done, nor indeed can we wonder at the folly of Broussais, in tracing all the phenomena of disease to the stomach, or others to the different tissues. Delirium and hiccup

appear early in gastritis, as in diaphragmitis, and for the same reason. Upon another occasion I was called to see a gentleman, ill of gastritis, in which the disease was attended with hysteria, the risus sardonicus, and a train of symptoms bordering on mania; the pain on pressure was intense. He not only complained of a sense of burning, but he said his feelings were those of fire. The patient under this anxiety frequently tears off his clothes; his limbs are violently contracted; he changes from place to place, and shows an unconquerable restlessness: upon swallowing drink he is for a moment soothed, but the burning soon returns, and feels as if coals of fire were laid upon the belly.

Under these spasmodic affections of the stomach, he vomits; the drink he has just swallowed is thrown out with great violence, and is sensibly hot to the hand as it is ejected. His countenance is pale, livid, distressed, and exhibits very much of the ghastly, spasmodic contraction of the muscles, that we oftentimes see in acute mania. When the vomiting continues, the lower portion of the intestinal canal is involved in the irritation, and if not relieved, an inverted action takes place, followed by the vomiting of the contents of the lower intestines. The offensiveness of the discharge, as well as its peculiar appearance, announces it to be of a stercoraceous sort. In some instances, the inflammation of the stomach ends in black vomiting, particularly of the flaky sort; i. e. portions of the villous coat appear to be thrown off; while in other instances, the matter discharged is of a coffee-ground appearance, or resembles a dirty brown water. These symptoms are not only the attendants upon that form of gastritis that is symptomatic of yellow fever, or other contagious fevers, but they frequently, too, follow inflammation that may have begun in the œsophagus, or in the cardiac, or the pyloric orifices of the stomach. These are fatal symptoms, and are soon succeeded by the cessation of all pain—a feeble pulse, cold sweats, cold extremities, convulsions and death.

The appearances, upon inspecting the body after death, are nearly similar to those after fatal peritonitis; viz. the vessels of the viscera are all loaded with blood, denoting high inflammation. The effusion of serum and pus, flakes of lymph or of gelatinous exudations, adhesions of the viscera, gangrene and sphacelus of the part most affected. In some few cases, this disease, as well as peritonitis, comes on in so mild a manner, and proceeds through

its whole course with so few of the symptoms that have been enumerated, and those, too, so moderate, that the practitioner, unless aware of the fact, will be deceived, and equally misled in his treatment.

"I have seen it," says Bedingfield, "destroy life without a single circumstance occurring by which its existence could be known, or even suspected, till within a few hours of dissolution." (p. 182.) So of peritonitis. "I have seen," says he, "cases of long continued peritonitis, in which the symptoms were at first so mild that till within a few hours of dissolution no apprehension of danger was excited by them." (p. 185.)

DIAGNOSIS.

Inflammation of the cardiac or pyloric orifices, is slow in its approach. There is less active inflammation. Colic—wants the peculiar hard pulse. In it there is less fever; the tongue is foul; not the white fur. There are symptoms of jaundice; the pain on pressure is relieved, in gastritis increased. In gastritis the pain is at the præcordia, but in enteritis the pain is near and around the navel. In peritonitis the pain is more superficial; and in many cases not accompanied by sickness of stomach, or any other disturbance of the intestinal canal. In hepatitis the skin is generally yellow; and there is pain in the right hypochondrium and shoulder. In phrenitis the state of the iris denotes the condition of the brain. Examine if it contracts upon the application of light, or if preternaturally contracted in the ordinary quantity of light. In that case, it shows that the irritation of the brain is probably symptomatic, and that effusion or congestion has not taken place, as after idiopathic phrenitis; which passive state of the iris generally denotes a fatal termination. This, too, is the test of congestion; or after taking spirituous liquors, if the brain be so oppressed as to show the passive state of the iris, the case is usually hopeless. If it contracts by light the patient will probably recover. (See Bedingfield, p. 187.)

EXCITING CAUSES.

Cold.—The free use of cold water, when the body is heated. Of this I have seen many instances; i. e. when previously excited

by spirituous liquors, this effect is more likely to be produced; but this additional source of excitement is not necessary. The body operated upon by heat, or excited by exercise, and spirituous liquors, previous to the use of cold water, is sufficient to prepare the body for the action of cold as the exciting cause.

The metallic poisons are another common source of gastritis—such as copper, arsenic, lead, antimony, &c. It arises, too, from vegetable poisons, such as opium, and the use of various poisonous plants. It will be produced by small pox, measles, scarlatina, typhus fever, yellow fever, &c.

Yellow fever, as you have seen, in a peculiar manner vents itself upon the stomach, as the very seat and throne of the disease. In like manner, aphthæ in children, and indeed in adults, spread through the stomach and intestines, producing inflammation as they proceed, showing it even at the anus in white ulcerations. So with gout; inflammation of the stomach is not unfrequently the effect of the pain, spasm, and other attendants upon the indigestion so intimately connected with that disease; while the accustomed fulness of habit in gout soon inundates and inflames the seat of irritation, whether it be the brain or stomach: they therefore die of phrenitis or gastritis, occasioned by the excitement of the system falling upon a very excitable organ, but not from any peculiar virus, which most persons associate with gout. And let me tell you, that while certain professors profess to reprobate the humoral pathology as taught in this college, they teach this very doctrine, as it regards this subject, to an inordinate extent, which I should deem altogether unwarrantable and absurd. The late distinguished Mr. D., of Philadelphia, died of an apoplexy; forsooth, it was denominated gout in the brain. Another person sinks under gastritis; this too is gout in the stomach. Another man is ill of the pains of rheumatism; it is a flying gout. These extravagant remains of the humoral pathology I trust will find no place in this school, however warmly urged, or pertinaciously retained elsewhere. So far then the dyspeptic stomach and full habit of gout may beget gastritis. It may arise from a blow on the stomach; a wound by cutting instruments, needles swallowed, or injury by a ball. It may arise from the irritations of indigestible substances or of overgorging, as in the case of the man who fell a victim to his folly in swallowing a great number of knives. It may be produced by the excessive use of spirituous

liquors. In this manner the cases of inflammation and disease of the stomach, originally from an affection of the orifices of that organ, are induced very frequently. In like manner such is the effect of excitement. I have no doubt that the mental anxiety and vexation which Napoleon experienced upon his fatal rock, laid the foundation of the diseased state of the stomach that terminated the existence of that distinguished and most extraordinary man.

TREATMENT.

Venesection, general and local, by leeches, large and repeated. As I before said, let not the small pulse or the pale visage deter you from the free use of the lancet, which alone can preserve your patient. Use caution in typhus, and in the exhausted debauchee; blisters must be applied early; clear the bowels by enemata; these may be thrown up frequently; but before the inflammatory symptoms have been subdued, and the irritability of the stomach allayed, neither food nor medicine can be retained; indeed they only serve to aggravate the disease; cathartics will not be retained. Use laxatives, such as calcined magnesia, and castor oil; administer the warm bath, but no ice or cold applications to the belly, as urged by Thomas. All your remedies should be simultaneously applied, for if the patient be not relieved in twenty fours, at farthest, the disease will probably prove fatal. Apply fomentations to the extremities; use the saline mixture, soda water, lime water and milk, milk and water—especially if proceeding from metallic poisons. Yeast is another anti-emetic; and sometimes let the stomach rest, by giving nothing. Emetics are recommended by some for the removal of vegetable poisons; but here great caution is necessary. Opiates too are of dangerous tendency, before evacuations have been obtained. Then you may use Dover's powders, or opium, with spiritus mind. or with ipecacuanha, to act on the surface. The diet should be milk and water, rice water, barley water, gum arabic in water, flax seed tea, soda water, with additional soda, lime water and milk. The regimen must be as in the treatment of other diseases of excessive excitement.

LECTURE LIII.

HEPATITIS.

HEPATITIS, or inflammation of the liver, is characterized by fever; tension and pain in the right hypochondrium, oftentimes as pungent as that of pleurisy, oftener obtuse; pain shooting to the clavicle and top of the shoulders; the patient lies with difficulty on the left side, attended with difficult respiration, dry cough, vomiting, hiccup. Sauvages and Sagar add to their definitions or characteristic symptoms, the yellowish colour of the skin, yellow urine, and yellowish serum in the blood drawn. These last are equivocal symptoms, depending on the part of the liver the seat of the disease; they are the evidences of one form of the disease, but not of another; as they are therefore not constant or essential symptoms, they are accordingly omitted by Linnæus and Vogel. The pain and inflammation, when seated in the membranous coverings of the liver, say from a blow, or whatever cause, will not necessarily derange the functions of the liver so as to effect the secretions, or to prevent the flow of bile into the intestines; therefore, this discharge, not being interrupted, it will not show itself in the complexion, in the urine, or in the blood drawn; consequently they are equivocal symptoms, i. e. of membranous hepatitis, though they are among the symptoms of that form of the disease which extends to, or is originally in the parenchymatous portion of that organ. Inflammation of the liver, like pneumonia, I divide into two species. 1st. That species which is seated in the membranes of that gland: and 2d. that which occupies the parenchyma, or cellular portion of it. Dr. Cullen has, in my opinion, made a very bad division of it into acute and chronic inflammation of the liver. The latest writers,

too, Drs. Thomas and Pemberton, among the rest, have followed him, without the least question of the correctness of that division. The term chronic inflammation, in my opinion is a bad term to apply to a primary inflammation, when seated in an organ of so much importance to the animal economy. It paralyzes the exertions of the physician, for he naturally thinks that as the disease is chronic, he too may be chronic in his remedies, and take his time for the cure of it. On the contrary, you have as much acute inflammation to contend with in Dr. Cullen's chronic species as you have in his acute form of hepatitis; nay, you have occasion for all your acuteness in detecting this form of the disease; for like the inflammation constituting the first stage of phthisis pulmonalis, (and indeed the same may be said of inflammation in the parenchyma of the brain, and the uterus,) it is extremely insidious in its approach, and such too is the mischief it creates, by the time the ordinary observer detects its existence, that you have reason to be very active in the use of all the means in your power for its removal, for frequently when you discern the disease, death stares you in the face. We shall therefore prefer the distinction which I have proposed, into membranous and parenchymatous inflammation of the liver, to Dr. Cullen's acute or chronic, which last should be blotted out altogether from books of practice; for even when the parenchyma of the liver has become obstructed from other causes, and inflammation supervenes, such inflammation is still acute, wherever it may present itself. Its symptoms, I grant, will be less severe and less easily detected, but they are so, as before remarked, because the inflammation is seated in a less sensible part of the body. Hence it is, that it is so frequently overlooked, and, as Dr. Cullen says, only ascertained after death, and then by the abscesses that are at that time found. But Dr. Cullen has not been as much conversant with hepatitis as the practitioners of the East and West Indies, and of this climate. But at this we are not surprised, when we find physiologists like Baron Haller, (*El. Phys.*, vol. vi.) denying that the internal substance of the liver possesses any degree of sensibility. Let us not, however, go to the other extreme, and join with a writer in the *Memoirs of the Academy of Sciences*, 1766, Mons. Farrain, who affirms that this latent inflammation may be certainly known by the pain felt upon examining the liver, near the xiphoid cartilage, and that it is the source of all the pains generally attributed to the stomach.

We shall now proceed, agreeably to our division, to notice the characters, progress, causes, and treatment of the first species, that which is seated in the peritoneal coverings, or membranes of the liver. It announces itself as most of the phlegmasiæ, by chill, succeeded by the general symptoms of pure synochal fever, and of local inflammation; the part affected immediately, or very early in the disease, is attended with an acute pain in the right side; and such is the connexion by nerves between the liver and stomach, that this pain also frequently affects the præcordia, and oftentimes extends to the clavicle, to the joint of the shoulder, (the physician, if not careful, will consider this pain as a rheumatic affection of the shoulder.) and to the scapula. These last symptoms arise from the connexion which exists between the phrenic nerves and the second and third pairs of the cervical nerves. Be careful, however, to distinguish it from similar pains which are occasioned by an adhesion formed between the lungs and diaphragm. Mr. White, a writer upon the virtues of antimony, has the following judicious observation upon this subject: "When a patient complains of a constant dull pain in the right shoulder, it is looked upon as a pretty certain sign of a diseased liver; but this," says Dr. White, "requires restriction, as that pain may be felt, and yet the liver be free from disease; and the liver may be diseased without causing such pain. If an inflammation seizes the liver on its right side, but not extending so far as the coronary ligament, it will not produce a pain in the shoulder; but if that ligament is affected, that pain is immediately produced. The reason is, the coronary ligament is connected to the diaphragm, upon which runs the phrenic nerve, which coming out from the third or fourth vertebræ of the neck, sends a branch which is spent upon the muscles of the shoulder. As this pain is felt, for the same reason, when the lungs adhere to the diaphragm, it is no pathognomonic symptom of a diseased liver." (White on Antimony, 12mo. p. 157.) But it is remarked, and very justly, by Dr. MacBride, (p. 446.) that the pain and other symptoms of this affection of the liver, exhibit some variety, according as the inflammation is seated on the convex or concave side of that viscus. That, when seated on the convex side of the liver, the pain is increased by the movement of the diaphragm, extending along the mediastinum, throat and clavicle. That there is also a great increase of pain on lying on the left side, while there

is a very sensible soreness to the touch on the right side. But, again, that when the inflammation is seated in the concave side, that the patient can turn with more ease, that it is not so severe, that he is not so much affected by the movements of the diaphragm, and that it is usually attended with great sickness of stomach and vomiting, and a sallow appearance of the skin, owing to the parts of the liver more immediately concerned in the secretion of bile, occupying the under or concave portion of that organ. I have a patient now (1824-5,) ill of hepatitis. This disease is seated in the anterior and convex portion, so large as to press on the stomach, to prevent the diaphragm from descending, to produce cough; the patient is obliged to lie chiefly on the back; yet no sickness of stomach, except by spasm; no derangement of the biliary organs, no yellowish skin or eyes, no yellow fur on the tongue; still it will go on, and probably prove fatal. The pulse in this disease, as when inflammation is seated in other dense membranes, is corded, hard, and frequent. The tongue too is dry, and covered with the white fur, and attended with much thirst; the skin is dry and hot; the excretions generally diminished; the biliary among the rest. But when vomiting is produced, a free discharge of bile shows itself, as we remarked was the case in peritonitis and gastritis, i. e. that the circulation through the liver is rapid, and when the excretories are unlocked by nausea and vomiting, that, in that case, they pour out an inordinate quantity of bile. The countenance is not generally yellow in membranous inflammation of the liver; the urine too, at first, is pale, but when the vessels are highly injected, the urine is voided of a very high colour, partly partaking of the fluid from whence it has been so rapidly separated. A cough, especially after the first forty-eight hours, is also a very constant symptom of hepatitis.

DIAGNOSIS.

This disease may readily be mistaken by the hasty observer for a common pleurisy, or an inflammation of the diaphragm: and as the stomach is much affected by it when seated in the concave side of the liver, it may also be confounded with bilious colic, when arising from biliary concretions. In pneumonia there is more cough, and earlier than in hepatitis; there is more difficulty of respiration; no pain of the shoulder, White's exception; not the

irritation of the stomach. Hepatitis, too, wants the peculiarities of diaphragmitis, and is easily distinguished from bilious colic. Hepatitis has fever, colic none, unless from the long continuance. In hepatitis the pain is constant, with a sense of burning in the part; in colic it returns periodically, and is more severe while it continues. The patient in the one case is doubled up with the torture he endures; in the other, his pain is constant, and especially increased by the touch; in colic the pressure of the hand gives relief. Hepatitis terminates by resolution, when plentiful evacuations are either effected spontaneously or by art; as by early hemorrhage or diarrhœa coming on spontaneously, the disease has been suddenly and unexpectedly removed. In like manner, by the artificial means of depletion to be pointed out, this termination may be expected when administered early. When the patient is thus relieved, the pain is greatly diminished, and the secretions are all restored. Be careful, however, how you pronounce the patient relieved from danger, by the mere cessation of pain; for such sudden release frequently announces fatal consequences. How are we then, to distinguish this symptom when favourable, from the same, when it proves the forerunner of dissolution? When favourable it is accompanied with a return of the perspiration and other excretions attended with a natural temperature of body. When unfavourable, the patient sweats freely, but they are cold, clammy sweats, and attended with a livid countenance, and with cold extremities. But hepatitis left to itself, also frequently proceeds, secondly, to suppuration, known by chills and hectic fever, and an elastic feel of the part. Cases also are recorded where it has found a passage through the colon. In other instances it has been discharged into the cavity of the abdomen, when it for the most part proves fatal; or it occasionally has been known to end, thirdly, in gangrene or sphacelus; and it has ended in dropsy of the belly; that is, the inflammation has terminated by serous effusion analogous to hydrothorax, the effect of pneumonic inflammation, especially if neglected or inactively treated. When it terminates in suppuration, if the inflammation be on the convex side of the liver, it either discharges itself externally, finding its way through the muscles and integuments covering the abdomen, which is the most common event; or it involves the diaphragm, pleura, and lungs, and is at length discharged by expectoration. But this is comparatively of rare occurrence, and is for the most part, fatal.

Not so in the Bridewell case, nor in the case in the hospital; nor in the case of Dr. Bard's patient, of which I have spoken.

Again, if seated in the concave side, it has been known to communicate with the biliary vessels, and the matter formed, discharges itself through the intestines. But in cases where it proves fatal, upon examining the body after death, extensive adhesions are found to have taken place, not only of the liver, to the adjacent organs, but of most of the abdominal viscera to each other, with large purulent or serous effusions, as after enteritis. The liver, too, undergoes great change; its whole substance being rendered more hard and compact, throughout its whole texture assuming the scirrhus condition; at the same time that it undergoes considerable enlargement, extending to the left hypochondrium as well as occupying the right: for the liver, as we have seen in the foetus, when supplied with an inordinate quantity of blood, readily admits of great distention. The weight of the liver in health is about three and a half pounds; by distention it frequently increases to eighteen or twenty-four pounds. Such is the current permitted to take place to the diseased organ before the malady is discerned or active measures pursued. In the case related of diseased liver, by Bartholine, that organ was so much enlarged that it weighed forty pounds!

The causes are similar to those of the phlegmasiæ in general. The predisposing are, a plethoric habit of body, the sanguine temperament, intemperance, and especially a preceding attack, or previous injury affecting that part. The exciting causes for the most part, are local violence, as from a wound or blow, and cold; and in some cases it is symptomatic; that is, derived from the inflammation of the adjacent viscera, being extended to the liver by continuity of membrane. Even pleurisy has been known in some instances to have involved the liver, and much more so will inflammation of the peritoneal covering of the abdominal viscera extend itself to that particular viscus; but in common with other abdominal inflammations, it has also been induced by the suppression of eruptive diseases, as erysipelas and others.

Treatment of this disease as in peritonitis, or by repeated and liberal bloodletting. In such case the bleeding must be large and repeated to the third, fourth, or fifth time, allowing due intervals in which to judge of its effects, and to ascertain how far the strength of the patient will endure it. Celsus gives us a good

rule upon bloodletting: “Interest enim non que ætas sit neque quid in corpore intus geratur, sed que vires sint?” (Celsus, lib. 2. cap. 10.) Pemberton directs it to be taken too, from a large orifice, in order to produce all the advantage of relaxation. This practice is questionable—though recommended in all the books. But in the case of the other means of depletion, be especially careful to employ those which are peculiarly useful in restoring the secretions of the liver, as well as the functions of the system; thereby you will diminish the fulness of that organ more than by any other means; analogous to the relief afforded by discharges from other glands and mucous membranes when they are the seat of inflammation, as the tonsils, &c. With this view, the mercurial purges, jalap and calomel, aa. gr. x. and the saline, are peculiarly beneficial. Blisters, too, should also be early applied in this complaint, and as near as possible to the parts affected. If the patient be not relieved in a few hours repeat the lancet; and this to be succeeded by large doses of calomel* and antimony, or the solution of antimony in nauseating doses, aiding its operation upon the surface by occasional fomentations, bathing the feet in warm water, and the frequent use of the thin tepid drinks which have been so frequently recommended in inflammatory diseases.

The same abstinence in diet, and attention in all respects, to the regimen of your patient, are also called for in this as in other acute inflammatory diseases.

The next species of inflammation of the liver, is that which is seated in the parenchymatous or cellular portion of that organ; improperly called by Drs. Cullen, Thomas, Pemberton, and others, chronic inflammation. Dr. Cullen states, that it has no characteristic symptoms, by which it may be known. As I remarked yesterday, Dr. Cullen has not had an opportunity of seeing many instances of hepatitis, except that seated in the membranes investing the liver, or he would have given you a different view of this subject. In the East and West Indies, in the tropics generally, and in our own country, this disease is frequently met with in all the various forms which that disease assumes, whether it affects the external coats of that viscus, or its interior structure. This species of hepatitis, as I remarked, like peripneumonia or phthi-

* Calomel alone, and in small doses, is highly objectionable. It adds to the inflammatory action, as I have said upon other occasions.

sis, makes its attack and its advances in a very insidious manner. Instead of the sharp, pungent pain of membranous inflammation, the patient only complains of a dull, heavy, solemn pain in the side, a sense of weight in the right hypochondrium, with the feeling of unusual fulness on the same side, and occasionally a shooting pain reaching to the clavicle, shoulder joint, or the scapula. In some instances, this pain is considered as merely a rheumatic affection of those parts, and the real seat of the disease is overlooked. But the patient does not alone complain of these local symptoms; he is himself sensible of a degree of feverishness; but compared with that of the first species, it may be denominated a febricula; yet there is manifestly a quickened circulation; the pulse is frequent, but comparatively soft and full; not the tense, corded pulse of membranous inflammation. I can speak very feelingly on this subject, having experienced this disease some years since; but which I have since prevented by the use of the lancet, two or three times a year. The patient, too, is sensible of increased heat, and especially burning of the hands and feet, attended with some thirst, and clamminess of mouth. He has a great disinclination for motion or exertion of any sort, whether mental or bodily. His functions, to a certain degree, are all more or less disturbed. His days are passed in dulness, and his nights are restless. He is especially impatient under the stimulus arising from the heat of his bed. He can only lie on his right side, for on the left the great weight of his overloaded and irritated liver renders him at least very uncomfortable, if it does not produce acute or severe pain. His nervous system is also much affected. His sleep is imperfect and unrefreshing. He dreams, he starts, and is much disturbed. And such, too is the interruption of the pulmonary circulation by the pressure of the liver on the diaphragm, that incubus, in all its distressing forms, is a frequent attendant on this disease. The blood crowds the part affected: and such, too, is the determination to the part affected, that his extremities are frequently cold, while his vessels are loaded, and his circulation sensibly increased. His respiration, too, is much oppressed; especially upon exercise, or when ascending a staircase; for there is a greater quantity of blood in all the larger vessels of the body, and circulating through the lungs; besides the effect of the enlarged liver, pressing up the diaphragm, and diminishing the capacity of the chest, and the

increase of the circulation. And sometimes the pressure upon the chest so affects the pulmonary circulation, that it produces all the symptoms of angina pectoris. Sometimes the lungs are so much oppressed that the blood does not readily return from the head; giddiness; double vision; a bloated state of the feet; numbness of the extremity result. His tongue, especially in the morning, after a feverish night, is furred and foul; covered, not with the white fur attendant upon membranous inflammation, but a yellow sordes, as if stained with bile. His teeth are also covered with a similar matter. His skin frequently assumes a dirty, dusky brown colour. The adnatæ of the eyes are of a yellowish hue. His urine becomes muddy. His bowels are costive. His stools become either clay-coloured, showing no bile in them, as in the stools of jaundice, or they are of a dark brown colour; i. e. coloured with bile that has been long secreted, and long pent up in the gall-bladder, or gorging the biliary vessels. All these symptoms are referable to the derangement produced in that part of the liver which is devoted to the secretion of the bile; those vessels being obstructed and constricted by the inflammation they undergo. These circumstances enable us satisfactorily to explain the fact recorded by Dr. Girdlestone, that chronic dysentery is frequently found connected with a diseased state of the liver, and that abscesses are oftentimes met with in that organ under similar circumstances. It was dysentery, therefore, symptomatic of a diseased liver, but not originally a dysentery that could have produced inflammation of the liver.

Among the other symptoms of this species of hepatitis are great irritation of the stomach, showing itself in great nausea, and sometimes vomiting; sometimes from nervous connexion, at other times by mechanical pressure of the liver upon the stomach. In some cases bile is thrown up, but this rarely occurs, and when it does, it is not bile of its natural yellow colour, as when newly secreted, but of a brown dark appearance, very much altered from its natural qualities and character. This form of the disease, too, not unfrequently attacks the bilious habit, that is, one who perhaps has been accustomed to large bilious secretions; in other words, of a full habit of body, and a debilitated state of the digestive organs, the liver and its excretions being affected in proportion to such fulness and irritation, the attendant on a debilitated state of those organs. A stricture now existing on the secretory

vessels of the liver the bile is re-absorbed, and returned to the blood, and thence appears in all the other secretions, while the gall-bladder rarely empties itself except by a very active emetic; when frequently a viscid snuff coloured bile is forced out of it, or perhaps gallstones are let loose in the relaxed state of the vessels which attends upon vomiting. In this state of the liver the abdomen is very considerably enlarged; and the patient lying upon his back, with the abdomen muscles relaxed, and his thighs bent on his body, the liver is frequently found not only very hard, but so much enlarged as to extend even to the left side of the belly, though this we know is not its extent in a state of health. But when thus filled and distended by disease, it occupies the left as well as the right hypochondrium; and its margin may be distinctly traced. But it is also proper to examine in an erect or sitting posture, for frequently lying on the back the liver retires within the margin of the ribs, and is not so easily felt; but in an erect posture, the liver descending about two inches below the edge of the ribs, its disease is for the most part more easily ascertained, especially upon inclining the spine forwards and towards the left side, and the part being examined during an inspiration, but when examining the patient on his back, examine during respiration. Moliere's joke about the heart is almost realized with regard to the liver; that is, it appears to have changed sides. Be cautious, however, in your decisions, and remember that it is not unfrequently the case that the spleen, which occupies the left side, is also enlarged at the same time with the liver, for the same causes which operate in producing the one effect not unfrequently produce the other. Obstruction of the spleen will produce an inordinate flow of the blood into the liver, being both supplied by branches of the cœliac, the circulation in the one diminished the other is necessarily increased. So a gorged state of the coronaries of the stomach by overfeeding, will load the liver; another reason why gluttons have overgrown livers. You can scarcely, however, make the mistake committed by one of my fellow practitioners, who pronounced a lady of my acquaintance having a calculous affection of the left kidney, to be ill of a disease of the liver! That a mistake as it regards the right kidney, should be made, is not surprising, for it has frequently happened, (see Portal,) that the enlarged liver extends downwards and backwards so far as to depress the right kidney, (see Repertory, sixth volume, p. 49,) and

even to occasion gravel, (p. 65,) and great pain in the right lumbar region; or perhaps the obstruction of both viscera may have arisen from the same state of the blood vessels. This form of hepatitis, like the membranous, has various terminations. In some instances this loaded state of the liver relieves itself by an unexpected hemorrhage or diarrhœa. Portal, who has recently written on the diseases of the liver, I find makes a similar observation, that hemorrhage from the liver either thrown up by vomiting, or passed off by the bowels, is in general salutary, though in some cases it is followed by fatal exhaustion. (See *Eclectic Repository*, Vol. vi. p. 53.) In like manner resolution is also effected by similar or analogous evacuations procured by art. A second termination of hepatitis, is by abscess, which in some instances has been so large and extensive as almost to excavate the liver, leaving the membranes a mere bag. Yet it is strange to tell, that Dr. Cullen could have committed the error of supposing suppuration ever to occur in this or any other organ without preceding inflammation and fever! Thirdly, in some instances it ends in large tubera, tubercles, or small abscesses, and the matter being absorbed, these are left in a scirrhus condition. But in other cases, the whole liver becomes so much consolidated and obstructed as to constitute a perfectly scirrhus state of the greater part of that viscus, analogous to the scirrhus of the breasts and testes, after inflammation. I pass over the nice distinctions made by Portal, such as his lymphatic obstruction, his albuminous, his gelatinous, mucous, and serous! There is more affectation in this attempt to delineate the varieties of this obstruction than utility, or indeed than truth; for it is impossible to distinguish them in life, and if we could do so it is not calculated to answer any important or useful purpose, at least that I can perceive. Subtle distinctions indeed, only serve to darken, not to enlighten, the subjects of our inquiries. When a physician like Portal, can recommend oil of worms, oil of puppies, oil of bricks, and pigeon's dung as a plaster for some of these affections, what can you think of him or of his opinions and his distinctions? These obstructions constitute the chronic disease of the liver, that is, after inflammation has subsided. Indeed it is very possible that acute inflammation may be even revived in this very chronic or scirrhus condition of the liver, in the same manner as we see inflammation and ulcer to take place in the breasts and testicles, or uterus,

constituting supposed cancer. A fifth termination of the inflamed or enlarged liver is by venting a serous effusion into the abdomen, constituting a dropsy of the abdominal cavity or ascites. Case of Mr. N—— G——, in whom the original disease was induced by a full habit of body, full living, and cold. Active measures were not employed; the physician, a Frenchman, kept his lancet in his pocket when it should have been on his patient's arm. Nature, in this state of the vessels, unloaded herself by serous effusion, but she destroyed the patient. But let us ask how does such enlargement of the liver produce ascites? First, by an excitement produced in every vessel circulating on the abdominal viscera and cavity; the great determination to the abdominal viscera in general. Secondly, by the enlarged viscus pressing upon the adjacent vessels and impeding the free return of blood in the veins; this impediment will necessarily create a diseased exhalation. Thirdly, the indurated condition of the liver itself, obstructing the return by the *venæ portarum*, must crowd the other vessels, and increased exhalation must necessarily be the consequence as well as the effect of long continued excitement.* Fourthly, by a diminished power in the absorbents. Such generally are the chronic consequences of preceding acute inflammation of the liver, when thus seated in the parenchyma or cellular structure of that organ.

CAUSES OF THE SECOND SPECIES OF HEPATITIS.

One of the most prevalent of the predisposing causes is general plethora. Remember that the blood of the abdominal viscera in its return to the heart, for the most part passes through this organ,

* Another consequence of this pressure on the returning vessels is hemorrhoids; hence the piles are so frequently noticed by practical writers as the attendant on diseased liver. In like manner the enlarged liver pressing upon the returning cava is said also to produce a varicose enlargement of the vessels of the lower extremities and anasarca. Another effect of this loaded and obstructed state of the liver is to produce an intermittent pulse, which both Morgagni, *Epist.* 36, art. 24, and Pemberton, account for by supposing that the blood conveyed by the hepatic artery not finding a ready passage through the hardened viscus, is thrown back upon the heart, and thus interrupts the regular action of that organ. So in like manner Pemberton accounts for the fluttering and pulsation at the pit of the stomach from the interruption of the *vena portarum* in consequence of the obstruction of the liver. In that case the *vena portarum* is filled and distended, and communicates the sense of undulation, considered by some to be aneurism.

by the vena portarum, independent of the supply of that viscus, by means of the hepatic artery. You also well know, that this organ is capable of great distension, as we see illustrated by its enlargement when the blood conveyed to it in the foetal state, by means of the umbilical vein, is distributed in that viscus which becomes nearly as much enlarged in the left as it is in the right side. And when this supply is cut off, and the biliary vessels are emptied of their meconium, with which they are loaded until compression is produced upon the body in labour, or by the respiration after birth, the liver then ceases to be so extended, and confines itself afterwards to the right hypochondrium, unless by some inordinate supply, the effect of disease or intemperance, it may again become enlarged in the progress of life. In this plethoric state of the body, the liver and the spleen, as well as the uterus, the breasts, and the brain, may be considered as so many cisterns to the blood-vessels, receiving the surplus blood of the system; and by their fulness manifesting such accumulation; and of course, in a condition to be readily excited to inflammation upon the application of an exciting cause. Accordingly, it happens that hepatitis of this species rarely occurs but in plethoric habits. The greater part of the patients I have seen affected with such hepatic obstruction, were persons of a full habit of body, and in habits of full feeding and hard drinking—living, too, a sedentary life. So, in like manner, the relative plethora which takes place after the natural cessation of the menses is frequently productive of this engorged state of the liver, and liability to inflammation.

Another predisposing cause is a previous attack, rendering that the weak and irritable part.

A third is violence done the part, by external injury, as the effect of a fall—as in my own case.

Under such circumstances of predisposition, the liver becomes easily affected with inflammation upon the application of an exciting cause; and that, too, frequently a slight one.

The exciting causes of this species of hepatitis are, for the most part—

1st. The heat of climate operating upon the full habit, unaccustomed to such high temperature. Heat, operating upon a full habit of body, as with persons recently arrived from a northern climate, necessarily increases the force of the circulation. This

impetus, too, will exhibit itself upon such parts of the body as are more distensile and yielding in their structure. The liver will partake most largely in this respect, not only from the impetus of its circulation, but from its great supplies by the venous system of the belly, and the vena portarum. Hence the extensive prevalence of this disease in the East and West Indies; in the tropics, and in our variable climate—especially in Europeans, newly arrived.

2d. Intemperance in eating and in drinking; and especially the excessive use of vinous, spirituous, and fermented liquors. It is accordingly remarked, that diseases of the liver occur more frequently, and are more rapid in their progress at the pay-time of the troops, both in the East and West Indies, than at any other time. (See Simond's Journal, Vol. i. 397.) The too free use of spices, and other condiments, calculated to excite the appetite, already impaired by excess. These, too, usually co-operate with the heat of climate to produce diseases, especially of the liver; and the digestive organs of the stranger, newly arrived, and who insensibly falls into these habits, and the dissipation so prevalent in hot climates. Thus initiated, he now takes his punch, his sherbet, indulges in the immoderate use of acids, cayenne pepper, and other excesses of the table. Hence it is, that in those hot regions free livers very soon make *full livers*. It is upon the same principle, that epicures stuff their geese for the express purpose of enlarging the liver, which is esteemed by them one of the greatest delicacies; (the celebrated *pâté des fois grasses* is thus prepared.) They make him drink incessantly, and feeding him at the same time, as much as he can swallow, and enlargement of the liver is the result. In like manner, the human goose, under the fire of the tropics, excited by hard drinking, and gorged by free feeding, begets a similar enlargement of the liver; for under this excitement, the digestive organs, and the whole system, are all soon affected, either directly with inflammatory diseases, or prepared to be so by the debility they produce, rendering them liable to such inflammatory action upon the check of perspiration by the cold of the night air, one of the most frequent exciting causes of inflammatory disease, especially in the hot latitudes. But spirituous liquors do more than all the rest in producing this disease. The fable of the vulture feeding thirty thousand years on the liver of Prome-

theus, as a punishment for stealing fire from heaven, is certainly a happy and an instructive illustration of the pernicious, as well as the chronic effects of ardent spirits upon that organ of the body. The figure is well sustained when it states that the liver, though constantly devoured, was not diminished, denoting the chronic disease, and enlargement, which are the consequences of this worst of all fires, that act upon the human system—rum drinking. Such debility, too, is also induced by the habitual use of medicines, to unload their already gorged digestive organs; and especially the indiscriminate use of mercury. For, as I have before remarked, in the West Indies, every case of dyspepsia is considered as a diseased liver! But this debility is not confined to the digestive organs. The venous system soon partakes of it. That part of it connected with the liver and abdominal viscera must necessarily become affected by it. Congestion will thus readily take place in the vena portarum, and its branches in the liver. And the least obstruction taking place to the free passage of blood through that distensile viscus, disease rapidly ensues. Another circumstance perhaps has its influence. Portal remarks, that the veins of the liver are proportionally smaller than in other organs, and particularly small compared with the size of the hepatic artery and vena portarum. If so, we may observe at the same time, an inordinate proportion of blood is conveyed by these two vessels to the liver, the less rapid returning it by the smaller veins must render that viscus peculiarly prone to sanguineous congestion. Especially, too, when the venous system becomes debilitated by age, intemperance, a hot climate, and its attendant excesses.

But the absorbent system no less partakes of the debility thus induced. Hence it is too that dropsy and a diseased liver are so generally associated; not only because the exhalation is increased, by the causes I have before enumerated, but also that the absorbent system is less active in the performance of its duties, in carrying off the effused fluids. Thus, too, it happens that fevers, intermitting and remitting, from their long duration in our southern states, as well as in hot climates generally, are followed by visceral obstructions and dropsy. But this disease is not unusual in this climate, as well as in the East or West Indies; and that too, from the same predisposing and exciting causes. The same fulness of habit, the same debauchery and manner of living, pre-

pare the body to be acted on by cold and the other usual exciting causes of inflammation in this as in other countries. Indeed, whatever excites and debilitates the nervous system, those organs, the liver, the stomach, and the spleen, are ever among the first to feel disaffected, and that too whether operated upon through the medium of the mind or body; especially this is the case if circumstances occur to fill the system, as in pregnancy, or when suckling. Mrs. P. is always affected with this congestion of the liver whenever she was with child, or giving suck; venesection, however, takes off the plethora thus existing. In the treatment of this inflammatory affection of the liver, seated in the parenchyma of this viscus, we should pursue the same system that has been pointed out in peripneumony, or in phthisis pulmonalis, viz: venesection, according to the age, temperament, habit of body, period of the disease, strength of pulse, mode of life, consistence and colour of the blood drawn. 2d. Attention to the excretions in general, but especially those of the liver itself; saline purges, sulphate of soda, calomel and jalap, senna and cream of tartar, Croton oil, elaterium, &c. But the object of these is not only to restore the excretions by the liver and intestinal canal, but to diminish the general fulness of the habit, by obtaining large discharges of the serous fluids of the system, and to create a revulsion from the part. 3d. With the same view, blisters should be applied, and that, too, early, over the right hypochondrium. Dressing them with mercurial ointment will also be proper; for if the ointment should not be absorbed, it will be useful, like the savin ointment, by keeping up a degree of soreness that would otherwise subside with the common dressing. 4thly: If the pain still continues, with the other symptoms denoting the continuance of the congestion and inflammation, next have recourse to the James' powders, and antimonial solution, in small doses. When the active inflammatory symptoms are subdued, and tumor remains, a combination of calomel and James' powder will be proper, not only as a cathartic, but with the view to their alterative effects, or to the possible operation of mercury on the salivary glands. 5th. Then leave your patient to small doses of calomel, night and morning, with the express view, not only of quickening the absorbent and circulatory vessels, but the affecting the mouth. For this purpose, too, combine opium with it, if it has a great tendency to run off by the bowels. Friction with mercurial ointment, in

the course of the absorbents, on the inside of the thighs, will also be advisable.

When, therefore, you have reason to know that this important viscus is the seat of congestion, and the inflammatory symptoms have been subdued by the means pointed out, viz: venesection, purging, &c., mercury will be your great resource: you will direct it, 1. as an active cathartic and diaphoretic, as in the other phlegmasiæ; 2d. to beget an inflammation in the mouth and salivary glands, and thereby to translate the inflammation from its original seat. But there is another, a third case of diseased liver, in which you will also have recourse to calomel; I mean as a diuretic, in combination with squills to remove the dropsical affections which are among the most usual consequences of an obstructed liver, in the manner suggested. But let me caution you against the abuse of this medicine, by employing it in dyspepsia instead of hepatitis; for as I have oftentimes observed, there is not only a connexion between the stomach and the liver, in its blood-vessels being branches of the same cœliac trunk, but in its nerves; the stomach thereby partakes of the sufferings of the liver; the liver, too, is more or less affected sympathetically with the stomach, as in the cases of several gentlemen, all affected with dyspepsia, and not hepatitis; for all affection of the liver disappeared as soon as the stomach acquired tone from the chalybeates and other tonics which I advised.

But as in peripneumony, so in hepatitis, you have a second stage as well as a first. In this the febrile symptoms are removed, the patient suffers no more pain, but remains debilitated; the liver is slow and torpid in its functions; the belly costive; countenance pale or sallow, wanting the florid complexion of health. Tonics are now indicated; the bitter infusion, tinctura amara, iron filings, and extract of gentian, Ballston waters, chalybeate wine; iron in the form of acetate by giving it in cider in connexion with horse-radish, mustard seed, &c. Nitric acid as used in the East Indies, is excellent in this stage. But in this stage of debility avoid calomel, excepting as a diuretic in case dropsical swellings are manifestly forming; then, too, be careful to preserve the tone of the system. Another remedy that you will find occasionally recommended in this disease and in the advanced stage of it too, is the cicuta, one of the most powerful narcotics that the Mat. Med. contains; yet in the opinion of its friends it is

to work miracles in unlocking the obstruction of this viscus. Delmas soberly proposed it, alleging that it is one of the best fendants or cleavers that the pharmacopoeia furnished. But beware of this fendant at this stage of the disease.

The diet of the patient in these various stages, should also receive the particular attention of the physician. In the first or active stage it should be as in membranous inflammation, equally antiphlogistic. While in the second stage it should be nutritious and moderately stimulating, viz: animal food, the stimulant condiments of the table, and the moderate use of wine, and such drinks as will readily be evacuated from the system; gin and water, brandy and water, hard cider; but avoid porter, ale, and beer, &c.; and exercise, especially riding on horse back, with the view of shaking the gall bladder, as Dr. Rush expressed it, speaking of the effects of an emetic in yellow fever. A journey or a voyage will also, with attention to diet, very much contribute to the recovery of the patient. But nothing can be more pernicious than a return to full feeding and the daily excessive use of spirituous and malted liquors; they will renew the very evils we have endeavoured to remove. But you will find a sentiment of a very contrary nature entertained by many: they believe that it is necessary, as it is vulgarly expressed, to keep the liver afloat, and therefore return to the very beverage, and the same excess, that produced the disease; that is, they continue to drink to cure the effect of drinking! On the contrary, by the strictest temperance alone, can the patient find security against a return of his complaint, to which he will otherwise be much exposed. A single fact on this subject will be of more importance than any abstract principles, however they may be expressed. This I relate upon the authority of my old master, Dr. James Gregory: "Some British officers, some years since, fell into the hands of Tippoo Saib; he wanted them to enter into his service; they, like loyal subjects of the king, refused. The consequence was, they were detained three years in irons, and were in all respects treated with great severity. A handful of rice, boiled into gruel, was the daily ration allowanced to each. They were chained two and two. Several died of the wounds they had received in battle, and the dead bodies remained in some instances, fastened to the living until they fell into decay; none of them hoped to live long; yet they not only lived, but their liver

complaints, under which, several of them laboured, and with which they came into prison, gradually disappeared; and when, after a long captivity, they returned to Calcutta, they found that many whom they had left well, had died of the very disease of which they had been cured, by the meagre fare prescribed by Tippoo Saib." So much for starvation as a cure of diseased livers.

LECTURE LIV.

SPLENITIS, NEPHRITIS, HYSTERITIS, AND CYSTITIS,

WHEN speaking of hepatitis, I remarked, that when the system is unusually loaded with blood, certain parts of the body become surcharged, and may be considered as so many cisterns to the blood-vessels; at the same time too that the body has its waste pipes in the various excretions, which also serve to diminish inordinate plethora. The spleen is one of those sponges of the body, and is very apt to become thus surcharged. Hence we see it like the liver affected with inflammation, or, in other cases, a chronic fulness of that organ, vulgarly called an ague cake, and which frequently is the effect of long continued fevers, and the debility they produce. There are no characteristics of this disease except the pain and tumor seated in the left hypochondrium, and pain shooting from the diaphragm to the left shoulder; there is sometimes a dry short cough, and sense of constriction about the præcordia. In nephritis the patient also complains of pain in the side, but it has its peculiar symptoms which distinguish it, as the retraction of the testicle, and the pain shooting along the ureters to the bladder, &c., and in females following the course of the round ligaments to the groin. Another disease with which it may hastily be confounded, is a spasmodic affection of the intestines, particularly the sigmoid flexure of the colon, in which lodgments of wind, or other contents of the bowels, in cases of costiveness, frequently produce pain, that may be, for the moment, referred to the spleen or the kidney as its seat. The costiveness, the intermitting character of the pain, will very clearly designate the intestinal affection as different from an inflamed spleen. The causes of this disease are very similar to those of hepatitis and the

other phlegmasiæ; not only plethora, and the other predisposing causes, but the exciting, as cold, &c., and frequently the two diseases are associated. But among the most common causes of the chronic tumor of the spleen, are long continued intermitting or remitting fevers. Hence it is most frequently met with in those countries where those diseases are most prevalent. Splenitis, like the inflammation of the liver, may be divided into membranous and parenchymatous, but not chronic, inflammation of that organ, as Dr. Thomas calls it. A chronic tumor of that viscus may exist, and it is not unusual for such enlargements to become the seat of inflammation; and in some cases it has been known to proceed, like the liver, to suppuration, discharging itself externally, or in the cavity of the belly: in other instances it has been suddenly carried off by diarrhœa or hemorrhage, as other enlarged organs, the liver, uterus, &c. The treatment should be the same as in hepatitis*—antiphlogistic in the first stage of inflammation; tonics, as chalybeates, in passive tumors of that organ, attended with debility. Calomel and iron it is to be remembered are among the best. But after the remarks we have made upon hepatitis, in its various forms, you can be at no loss in the treatment of a similar inflammation or obstruction of the spleen.

NEPHRITIS.

Nephritis—inflammation of the kidney. The characteristics of this disease, according to Dr. Cullen, are, “Pyrexia; dolor in regione renis sæpe ureteris iter sequens; mictio frequens urinæ, vel tenuis decoloris, vel ruberrimæ; vomitus; cruris stupor; testiculi ejusdam lateris retractio aut dolor.” The pain, too, frequently affects the small of the back, the neck of the bladder, and very generally the glans penis. In women the pain follows the course of the round ligaments to the groin, where they terminate and spread themselves. The urine, too, is in some instances not only very red, but more resembles the bright red arterial blood in a diluted state. The ratio symptomatum is called for in this disease as well as in hepatitis. How is the vomiting which so constantly attends upon nephritis to be accounted for? 1st. By

* In India, where it is more common than in temperate climates, punctures and scarifications are much employed.

the general connexion that exists between the nervous system. Hence, pain in any sensible part is apt to affect the stomach, which so largely sympathises with the nervous system. 2d. We are to recollect that a very peculiar connexion exists between the stomach and kidneys, in consequence of the renal plexus being composed of nerves sent from the cœliac ganglia.

How, again, do we account for the retraction of the testicle of the same side? The spermatic nerves are derived in part, from the renal plexus—so also those of the round ligaments in females. This disease terminates in resolution, that is, where active measures are taken, or large spontaneous discharges take place; or in suppuration, which is the most frequent. Either then terminating by a discharge of matter through the ureters into the bladder, or entering through the intestines and muscles in the back. In some few cases it ends in gangrene.

CAUSES.

In some instances this disease proceeds from cold, as its exciting cause; and especially attacks the full habit, and those who have previously been the subjects of it. Hence, it is one of the diseases attendant on a gouty habit of body, whether hereditary or acquired; for in both a plethoric state of the system usually constitutes a part of the disease. Yet in some instances there is also an acquired predominant lithiasis of the habit in which a redundancy of the uric or lithic acid becomes the exciting cause of nephritis, and if not the exciting, is at least a predisposing cause. But in a child under my care, a quantity of this earthy matter was discharged in the process of its complaint; but the child was at first attacked with a pneumonic inflammation, from which it was recovering when it was attacked with nephritis. Here, then, calculous matter in the kidneys was the exciting cause, as it proves in arthritic habits. In other instances acrid matters, such as cantharides, turpentine, balsams, beget inflammation of that organ, especially when given in large doses.

TREATMENT.

Venesection, cupping, early, as no organ when inflamed, is so readily disposed to suppuration; saline cathartics. The warm bath,

fomentations, semicupium, open bowels, are especially useful as anti-spasmodics when a calculus may be passing. Dr. Gregory objects to salts, and recommends castor oil, manna, sulphur, senna, crem. tartar. Large enemata—blisters are of great benefit. There is no objection to their use, if you only avoid the injury they produce when badly prepared, or too long applied. Dr. Cullen's objection to blisters is not well founded; nor is Dr. Thomas' mode of preventing the evil from them of any avail, viz: sprinkling camphor over them, nor a covering of gauze! These also relax the kidneys—diaphoretics, sp. mind. and laudanum, Dover's powder—diuretics, nitrate of potash, and gum arab., soap alone, or soap and soda in equal parts. Dr. Bard used to give the soap in coffee. Emetics—magnesia, to keep the bowels easy. Digitalis—opiates large, every two hours. When the inflammation has terminated by suppuration and the symptoms of inflammation are removed, the balsams, chalybeates, chalybeate waters, the bark and other tonics are indicated. The leaves of the uva ursi are also highly recommended by Dr. Thomas and others, in this state of the urinary organs, ℥i. to ℥i. three times a day of the powder, or in tincture. The arbutus uva ursi is used more as an astringent to counteract the profuse discharges of mucus, as in the catarrhus vesicæ.

Drinks—diuretic and demulcent; barley water, flaxseed, muskmelon seeds, parsley root, watermelon seeds, soda water, or ℥ss. of potash, ℥ij. water charged with fixed air. The food should be plain during the inflammation—regimen antiphlogistic during the active stage of the disease; to prevent its return—flannel next to the skin, occasionally warm bathing, warm feet. Avoid the common practice of bathing the feet in warm water, as it renders them very sensible to cold; bathing in cold water, on the contrary, renders them warm and preserves an active circulation in the extremities.

HYSTERITIS VEL METRITIS.

Hysteritis, or inflammation of the womb. The term is derived from *ὑστέρη*, the womb. This disease is characterised by pains, tension, swelling in the hypogastric region, extending to the groins and down the thighs; vomiting, hiccup, dysury or ischury, the os uteri painful to the touch, fever in some cases synochal,

in others typhoid. Great dispute has constantly existed about the nature of this disease, that is, as far as it is connected with puerperal fever, whether it be purely inflammatory or not. Dr. Young considered it as one of the putrid fevers, and a disease of debility; others as purely inflammatory. In private families in the upper walks of society, it is a simple inflammatory disease, a synochal fever; but in hospitals, and in the confined filthy apartments of the lower class of people, it assumes the typhoid type. Accordingly, whenever it has shown itself in the lying-in hospitals of Paris, Lyons, Dublin, London, Edinburgh, Aberdeen, and I may add New York, it has in many cases exhibited this last form of fever, and has been considered both a fatal and contagious disease;* that is, the poison of typhus has spread fever, and attacking the lying-in women, an inflammation of the womb has been its accompaniment: and the disease has, in such institutions, only been arrested by evacuating the wards or houses, by free ventilation, by white-washing, cleaning the floors, bedding, furniture, and the other means of arresting the progress of typhus fever. In Edinburgh, in 1774, the disease was checked by these means by Dr. Young, then the obstetric professor. Similar proceedings arrested the disease in Manchester, in 1800, as you will see stated, I think, by Dr. Hull, in his work on phlegmasia dolens. (See p. 46, 8. See also Willan diseases of the skin, p. 516, vol. i. in which he speaks of the contagious puerperal fever. See also Pouteau's observations on the same subject in the *Memoirs de l'Acad. des Sciences*. See also Gordon on the same typhoid form of fever as it occurred in Aberdeen.) This has led me to divide the disease into two species, as I have done catarrh, and tonsillitis, that is, into a simple inflammation of the womb, and that which assumes a malignant or typhoid character, hysteritis simplex, and hysteritis maligna. The first is characterised by synochal fever, the second by the symptoms of typhus superadded to the local inflammation of the womb. It comes on as the phlegmasiæ, generally with chills, attended with soreness, which is soon extended over the whole abdomen, which is painful to the touch; pain in the groins at the insertion of the round liga-

* Of six hundred and fifty-three women delivered in one of the London lying-in hospitals, eighteen died of puerperal fever; and of three thousand two hundred and six delivered in the lying-in hospital of Dublin, twenty-nine died.

ments; sometimes in one of the groins. The pulse, tongue, urine, are all different, depending on the circumstances under which it occurs, and the causes producing it, whether purely inflammatory or typhoid. The milk is diminished, the breasts painful, the lochia checked, the respiration hurried and frequently anxious; the belly is swelled and remains so after the urine is passed; this distinguishes it from cystitis, with which alone it can be confounded, unless we also except peritonitis. It terminates by resolution. It terminates also in scirrhus; and in sphacelus, which is manifested by sudden relief from pain, cold sweats, cold extremities, tympanites, a livid countenance, an irregular pulse, now scarcely perceptible. Many trace all the complaints which supervene to their lying-in, to the injury then supposed to have been received.

PREDISPOSING CAUSES.

Great debility taking place in pregnancy, or during parturition; by the great irritability accompanying it; inordinate distension of the womb and peritoneum.

EXCITING CAUSES.

1. Cold. Checking the natural secretions, or the lochia. 2. Heat of the rooms. 3. Hot drinks, as it regards temperature; spirituous drinks; animal food; spices. 4. Much company; 5. Mismanagement during or immediately after parturition; tedious labour; violence in the use of instruments, or in the removal of the placenta; retention of the placenta after delivery. 6. Obstinate costiveness. 7. Fever; viz. milk fever; typhus fever; scarlet fever.

This leads me, too, to make another distinction into idiopathic and symptomatic hysteritis, as symptomatic of typhus. Hence it was called a contagious puerperal fever by Gordon, Young, &c. In this way, it lately prevailed in New Jersey,* supposed to be conveyed by the accoucheurs, as well as by other channels of communication.

* Three years since, in Elizabethtown and the neighbouring country, in this city I have also met with it. (See Brewster's Cyclopaedia. Notes to the article Medicine.)

8. In cases of pure hysteritis, it has sometimes been induced by violence during the honey-moon. I have seen cases in which it was induced by sexual intercourse. 9. Dysmonorrhœa. 10. The sudden suppression of the menses, and the natural cessation of the menses have both produced inflammation of the womb. It is said, too, to be more frequent with women who have never been with child than those who have. Scirrhus and ulcer are both the result; and there are many such cases where the preceding inflammation is overlooked; i. e. where the disease has been more particularly seated in the cellular and vascular part of the womb. In some cases, the scirrhus exists without inflammation, as in the liver and spleen. Every tumour of these organs does not necessarily imply an inflammation of them, though pre-disposed to inflammation.

TREATMENT.

Venesection—but there must be caution when it is combined with typhus, or the patient is much debilitated. You must be governed by the condition of body, by the cause, and the evacuations she may have undergone. In idiopathic and pure hysteritis, a copious bloodletting is called for. Spontaneous hemorrhage or an inordinate flow of menses coming on has removed it. Fomentations of vinegar and water, not spirituous, semi-cupium. Open the bowels by calomel, gr. x.; by salts, oil. Enemata daily, used as fomentations also. Calomel and antimony; antimonial solution; sp. mind. and laudanum; Dover's powder; opium is useful in inflammatory diseases, after venesection. It is recommended by Dr. Armstrong in most inflammatory diseases; and is especially indicated where the inflammation is located in parts of great sensibility, as in the disease now under consideration. The breasts are to be drawn; blisters should be applied early; avoid emetics. Denman's antimonial mixture, however, is useful in the forming stage; but even then, nauseating doses are preferable—avoid bark.

DIET.

Drinks.—Teas; barley-water. Avoid heating, vinous, or spirituous drinks. Avoid spices and every thing exciting.

Cases proceeding from the contagion of typhus, scarlatina,

are to be healed accordingly by keeping in view the debility and prostration produced by that cause. Great caution is necessary in the use of the lancet. Greater attention should be given to the excretions, particularly those of the arteries, by antimonials; restoring the lochia when checked, or the menses when suppressed. These are to be solicited by fomentations to the abdomen, and by enemata. In cases of a tendency to gangrene, or sphacelus, as occurs sometimes in inflammation from a retained placenta, use injections of yeast and water, thrown into the womb, or diluted muriatic acid. The air of the apartment should be purified—in an hospital especially—not forgetting all the ordinary means of guarding against the spread of contagion; ventilation; change of clothing.

CYSTITIS.

Pyrexia; hypogastrii tumor et dolor; mictio frequens dolorifica vel ischuria; tenesmus. Fever, tumor and pain of the hypogastrium, frequent and painful passage of the urine, or retention of it, with tenesmus. In some instances, if early and active measures be pursued, this disease, being seated in a mucous membrane, ends in resolution, in which case it goes off by a large secretion of mucus, as an ordinary catarrh. In other cases a purulent discharge takes place, after which also the patient may recover; but most usually, such is the sensibility of the bladder, and the violence or rapidity of the disease, that it frequently terminates in sphacelus. When the inflammation is seated in the bas fond or lower part of the bladder the perineum is affected; if in the neck, retention of urine, and constant effort to evacuate, but total inability; if the fundus, a stilicidium, unceasing dribbling; the bladder feels a sense of fulness, and the patient makes constant efforts, and the fundus, too, to get rid of it.

CAUSES.

One of the most powerful predisposing causes to this disease is the debility arising from age and intemperance. Hence, too, plethoric gouty habits of body are most liable to be affected with it; not only because they pass more earthy matter than other persons, but because of the worn-out or enfeebled state of the nervous system, and of those organs which so largely partake of it, together

with the pressure of the brain connected with fulness. The debility, too, from excessive venery will have some effect upon the neighboring organs.

EXCITING CAUSES.

1. Over-distention of the bladder by retention of the urine. A patient of mine fell a victim to this disease, thus induced. He had been dining out, neglected to empty his bladder; inflammation was the consequence of over-distention; it ended in sphacelus. An aged gentleman in the neighbouring county, also sunk under the same disease, from retention of urine, the effect of cold, and the inability of three attending doctors, within thirty miles of the city, to draw off his urine. But this inflammation from retention is not always fatal.

2. Pressure on the bladder by early pregnancy, producing retroversion of the uterus, which usually takes place about the third month, before the uterus rises out of the pelvis; it especially follows retention of urine in the first instance. Retroflexion is another cause of such injury after parturition, but is of rare occurrence.

3. Cantharides, either made use of internally or applied externally after vesication is produced. For the most part a soreness only is occasioned; but in other instances severe inflammation is the consequence. The turpentine may also in small quantities inflame the bladder in a full habit of body. Large quantities prove laxative, and therefore pass less readily by the kidneys.

4. A calculus in the bladder, especially when the irritation it occasions is added to by intemperance, or by violent exercise. Dr. Franklin, when in Europe, and labouring under this disease, had occasion to get into a carriage, when he was furiously driven by a deaf coachman over a rough road, to his great annoyance and distress. Unable to stop his coachman by his loudest cries, the old gentleman at length reached his place of destination; when he left his carriage he swore, that never swore before, he would never enter another, unless he ascertained before hand that the driver had a stone also in his bladder.

5. A badly treated gonorrhœa or urethritis is, in some instances, followed by inflammation of the bladder. I mean badly treated in two ways; either by a metastasis, i. e. suddenly removing the inflammation from the urethra by lead injections, or by the use of

too stimulant or irritating injections, at the same time that no attention is paid to the diet and regimen of the patient. A fifth exciting cause of this disease is, mechanical injury to the bladder or its neighbouring parts. Strange as it may appear, I once attended a young lady, ill of this disease, in which it was induced in a very extraordinary manner, by a blow on the pubes, which also injured the urethra, and, by the inflammation induced, interrupted the passage of urine. She was running down the kitchen stairs from the entry, her foot slipped, one leg went down, and caught her precisely in the notch of the pubes against the door; this was certainly a very unlucky stroke for the poor girl. But this was not all, her feelings were still more called upon: for I was obliged frequently to introduce the catheter before she obtained relief from the complaints induced; but she recovered without any permanent bad consequences, either from the disease or the remedy employed.

TREATMENT.

Venesection large and repeated; cathartics, especially the saline; enemata frequently, and large, but not very stimulating; a warm bath, or the semicupium; fomentations, a bladder of warm water; blisters over the region of the bladder. The caution of Dr. Cullen, as before remarked, is unnecessary, only be careful not to continue the application after vesication is produced. Bedingfield remarks, that blisters applied near the urinary organs are not so apt to affect them with strangury as when applied upon parts at a distance. Diuretics, nitrate of potash, and gum arabic aa. gr. xv. sp. nitri dulcis, a small spoonful frequently, aided by diuretic and mucilaginous drinks. The catheter—which should be used two or three times a day, to prevent the distension which follows and adds to the inflammation. The frequent introduction of the catheter also enables the bladder the sooner to recover its functions. I believe the neglect of this rule, or rather the want of it has been the great reason that the catheter becomes so necessary when it has been once employed. The bladder, as well as some other organs, is in this instance under the influence of habit. Do not, however, proceed to the other extreme, and keep it in the bladder; this again becomes a source of fresh irritation by the accumulation of the

earthy deposits of the urine. Yet, in some instances, as in strictures, accretions on the catheter will not take place for some seven or eight days, sometimes more. Its being used occasionally, say once in two days, may prevent this effect. Cross says, once in four days. (See his account of the medical schools of Paris.) When it is attended with much inflammation and difficulty of introducing the catheter, we must leave it in, as the least of two evils; this is very necessary in such cases. Injections of milk and water into the bladder, must be had recourse to frequently, to soothe the irritation. The uva ursi is very useful in counteracting the lax state of the mucous vessels of the bladder, which is otherwise apt to end in a catarrhus vesicæ. The balsams also are useful to counteract such passive state of the parts; partial cold bathing may also be employed with advantage.

LECTURE LV.

URETHRITIS, OR GONORRHŒA ;—ORCHITIS.

URETHRITIS, or inflammation of the urethra, as its name imports. By this disease I do not mean gonorrhœa, which strictly signifies a seminal discharge. The application of it to the disease now under consideration is certainly an abuse of the term, as inflammation characterises the one disease, and is in all instances wanting in the other. Urethritis is improperly placed by Dr. Cullen in the class locales. For all the phlegmasiæ might also, with equal propriety, be placed in that class as well as inflammation of the urethra. Surely, ophthalmia, if urethritis, should be considered one of the locales. In my opinion, too, it is badly defined by Dr. Cullen; viz. "Three or four days after impure connexion, inflammation shows itself, and a puriform fluid, with dysuria, flows from the urethra." Saying nothing of the preceding inflammation and fever, both of which usually attend upon this disease, and ought to receive attention, especially when placed in a class which does not recognise either fever or inflammation.

The seat of this disease, as we all know, like the eye, possesses great sensibility; and hence active inflammation, and general febrile irritation, are to be looked for.

The symptoms of this disease are so familiarly known to you, that I need not dwell long upon their enumeration. I may just remark, that they consist, in the first place, of a sense of fulness in the urinary passage, and an unusual degree of heat and irritation at the time the urine passes through it. Such, too, is the degree of fulness in the mucous membrane, lining the urethra, that the passage itself is diminished; a general stricture exists upon it, and the stream of urine is frequently narrowed to a

thread, or is forked. But the patient not only labours under ardor urinæ; the pain and soreness extends to the neighbouring organs; it affects the neck of the bladder, producing a tenesmus of that organ; extends to the kidneys, producing not only pain in the back, but shooting down the ureters, with frequent calls to pass water. This excretion, too, is high coloured, from the increased excitement in the vessels of the kidneys, and which more saline condition of the urine probably, too, increases the heat and burning attending the passage of it though the urethra. The testicles are also involved in the irritation. They frequently become exceedingly painful to the touch, with occasional very severe pain shooting through them; and sometimes a retraction of them, as in other nephritic affections. Upon an erection taking place, the inflamed and enlarged urethra being put upon the stretch, very acute severe pain is necessarily the result, called chordee. This is very generally the attendant upon this disease, as the effect of the excitement in the parts, and the irritation of the bladder, occasioned by the high coloured urine, which is now secreted. With this symptom, too, there is also frequently great tenderness and irritation about the glands of the groin; and in some cases, buboes are produced, the effect of irritation. So also, in like manner, a phymosis, or a paraphymosis is produced; i. e. an unusual tumour, and thickening of the prepuce, either involving or covering the glans penis, that it cannot be denuded, or the glans itself is protruded beyond it, and enlarged so that it cannot be withdrawn within the inflamed and thickened prepuce. But I may here remark, that both phymosis and paraphymosis are more frequently the attendants upon the chancres of syphilis than the inflammation of the urethra: and if not properly managed during the healing process, will leave the neck of the penis under a permanent ligature; and if the sores be not properly cleansed, that are concealed behind the neck of the penis, the inflammation frequently ends in sphacelus of that important organ, and especially the most important part of it. The whole system, too, becomes affected with synochal fever, depending for its degree upon the habit of body, the age, and other circumstances under which it occurs. In the young subject, and where it is a first offence, the sufferings of the patient are usually more severe than in the hardened sinner, who has undergone frequent attacks of this disease.

Urethritis I divide into two species. 1st. Urethritis maligna, arising from venereal poison, which is communicable. 2d. Bigna vel simplex, where it arises from other causes, as from gravel or gout, in which cases it is not communicable. This last form of the disease I have frequently met with in persons labouring under a gouty, that is, a full habit of body, and in those subject to nephritic complaints. In these cases the inflammation appears to be produced by the saline and earthy materials which are frequently discharged in inordinate quantity, especially in the winter season, and the winter of life. In some instances, too, it is symptomatic of stricture in the urethra from preceding affections of this nature.

DIAGNOSIS.

The only diseases with which this complaint can be confounded, are, 1st. Gonorrhœa dorrentium, or seminal discharges at night. 2d. Gonorrhœa mucosa, or gleet, the consequence of urethritis, or the attendants upon nephritic or gouty affections; and 3d. Syphilis—this last disease is invariably preceded by chancres. I have never met with gonorrhœa ending in pox; nor have I ever known pox to produce clap; and even though an ulcer be produced by the matter of gonorrhœa, no constitutional affection follows. In the Edin. Journal for July, 1815, you have absolute proof of this fact. Hunter and Thomas are certainly in error on this subject, considering these two diseases the same. Besides syphilis was known one hundred years before we hear of gonorrhœa. They are two totally distinct diseases in their nature and character, and require altogether a different treatment. In this, all the oldest practitioners of our city concur. From the time I entered practice to the present time, I have never employed mercury in urethritis, and never had a patient to suffer a constitutional syphilitic affection, not in a single instance.

The treatment must vary according to its two stages, the active or inflammatory, and the passive. In the first, venesection must be used, if the patient is of a full athletic habit. With active inflammation, bloody urine, and febrile symptoms, leeches must be applied. Cathartics—salts to be preferred. Diuretics, nitre and gumarabic aa. gr. x.; warm bathing, tepid fomentations, washing the parts with warm water, injecting with the same; a sudorific

anodyne; acescent and mucilaginous drinks, lemonade, barley water acidulated, flaxseed tea, soda water, cream of tartar with tamarinds; avoid wine, spice, animal food, especially while the chordee and other inflammatory symptoms remain. The opiate to allay this troublesome symptom, and other irritations, is no less useful than in ophthalmia; wine and other stimulants will produce this symptom. Make use of moderate exercise. Local remedies—injections of milk and water, warm water; a poultice of bread and milk; after a few days, during which period depleting means have been employed to reduce the inflammation and general febrile excitement, and these have subsided, then make use of an injection of the sulphate of zinc, from gr. ij. to gr. iv. to an ounce, five or six times a day. But of all things, let me advise you to avoid lead injections; as in ophthalmia they for a short time check the discharge; but heat and burning frequently follow, and the consequences are usually much worse than the original disease for which they were prescribed. The consequences are, swelled testicle, gleet and stricture. I have seen numerous cases of all these effects of lead injections. Cubebs, or the piper cubeba, has been very much used, in doses of from ʒi. to ʒiij. powder of the berries, two or three times a day; or from ʒi. to ʒiij. of the tincture. I have no doubt of its utility in the passive stage of the inflammation of mucous surfaces. In that stage I should prefer it. Balsams also, are admissible only in the advanced or passive stage.

One of the consequences thus induced, is inflammation of the testis, or orchitis. This disease is characterised by—1st. A sense of fulness in the testicle, and tenderness to the touch, followed by a manifest swelling or enlargement. 2d. Pain in the organ affected, and in the parts more immediately connected with it, extending along the cord to the abdomen, to the back, and particularly affecting the kidneys. Even peritonitis has been induced as the effect of the irritation. In the case of J. R. the whole belly became tender to the touch, and demanded all the active treatment for its removal, as in idiopathic inflammation of the membrane lining the abdominal cavity. Inflammation of the testicle has various terminations if not removed by active depletion, or transfer of the inflammation. 1st. Effusion of blood, or hæmatocele. 2d. Serous effusion, or hydrocele. 3d. Suppuration sometimes—this not frequent. Scirrhus enlargement very

frequent. Sphacelus very rarely. The duration of the inflammation is generally such, and especially being seated in a secreting gland, that we have ample opportunity of removing the inflammation by resolution, if those measures we employ, are judicious, and at the same time promptly made use of. The more common causes are, 1st. Cold. 2d. Mumps is not an unfrequent cause of this disease; but 3d. More usually a sudden removal of inflammation from the urethra, especially by lead injections, is the source of this disease.

TREATMENT.

1st. Venesection and leeches particularly useful. 2d. Open bowels. 3d. Emetics—John Hunter's explanation not well founded, except that they excite great relaxation, and restore the excretions of the whole system. As far as there is a connexion between the cæliac ganglia the renal plexus and the spermatics; the kidneys and testicles will be the first to experience the relaxation to be desired in affections of those organs; but not acting by exciting particularly the absorbents of the testicles, but rather diminishing the flow of blood to that organ. 4th. Calomel and the pulvis antimonialis. 5th. Fomentations of vinegar and water; the application of tepid lead water and laudanum. 6th. Avoid cold applications; they add to the immediate sufferings of the patient, and indeed they oftentimes produce permanent injury to the part affected. I believe no practitioner would think of applying cold to an inflamed breast, or an inflamed uterus. I believe it to be equally improper to make use of cold applications to the testicle, or in ophthalmia. Dr. Ware, as I have already said, used warm applications in the latter years of his practice. Indeed in cases of uterine obstruction producing fluor albus, cold applied for the latter, invariably aggravates the former—an error of practice frequently committed by those who do not look to causes, but prescribe for symptoms—the hydra's head. 7th. Blister the part if the tumour remains obstinate. 8th. Be careful, too, to support the part by means of a suspensory bandage, especially when the patient is out of bed. 9th. Restore the discharge by the urethra, if it has been suddenly suppressed. For this purpose, make use of injections of warm milk and water. I have also, in some cases, brought back the soreness of the urethra

by an injection of the corrosive sublimate, gr. i. to gr. ij. to an ounce, expressly to reproduce the inflammation, and thence to relieve the testis; if scirrhus be apprehended, repeat the blister; if the tumour remains torpid, involve the part in a—11. Mercurial plaster—12. And give calomel to excite the gums, and to quicken the absorbents of the part. The elm bark poultice has been found so beneficial in distressing and obstinate enlargement of the breast, it probably may be found no less beneficial in discussing an analogous obstruction of the testicle.

Gleet, or gonorrhœa mucosa, is also among the sequelæ of neglected or mismanaged clap; that is, a relaxed or catarrhal state of the excretory vessels of the urethra and an increased and preternatural discharge from them. Be careful, in the first place, to ascertain the fact, that gleet exists—erroneous impressions on this subject seize the minds of patients from want of correct information, by consulting books which they do not understand. A gentleman applied to me some years since, who was rendered wretched by the belief that he had this disease; he took many medicines without effect. Upon examining him, I found that no disease existed, except in his mind. His penis showed nothing more than the natural mucus that is to be forced off, especially in the morning. He was of course, very readily cured of his real disease, but not so soon of his imaginary gleet. In every instance, I mean in the male, (for females have fluor albus from other sources,) in which I have been consulted, this disease was the effect of lead injections made use of for urethritis. You must not be surprised after this fact, that I should altogether condemn lead injections in clap; for I know of no application which so relaxes the part affected, as this metal does; and indeed, when accidentally taken in the stomach in large quantities, that viscus never after regains its tone, nor the constitution its vigour.

The remedies for gleet, as like chronic catarrh it is the effect of debility, will consist chiefly in the use of stimulants and tonics; chalybeates are among the best; iron and gentian; mineral waters; Peruvian bark; cold bathing, general and local; balsams; sp. terebinth. from one-half a teaspoonful to ʒss. three times a day; tinc. cantharides, gtt. xv. to xxx. gtt. three and four times a day. Cubebs may also probably be used with advantage in this state of the parts; blister in perineo; injections of the sulphate of zinc, two, three, or four grains to an ʒj.; injections of

corros. sub. gr. ij. to ʒj. A case was cured by injections of sea water. (Edinburgh Journal, July, 1815.)

The diet should be generous and stimulating; animal food; condiments; mustard, horse-radish, cayenne; wine, madeira, port; gin and water. Exercise on horseback; a journey; moderate connexion with women, that is, lawful—this I suppose need not be urged upon you, except that it be moderate. Another evil consequent upon urethritis, and frequently upon the improper treatment of it, is stricture, or diminished diameter of the canal of the urethra, from neglect of this surface in its inflammatory stage. This appears in different parts of the urethra, from the glans penis to the bladder. It is very properly divided into temporary or spasmodic stricture, and permanent stricture, which last is usually the effect of inflammation, and consequent thickening of the membrane lining the urethra. The last is frequently met in any part of the passage of the urethra, and oftentimes within an inch or two of the glans penis; not so temporary or spasmodic stricture; this is more usually observed to take place in the membranous part of the urethra, where it is covered and acted upon by muscles, which stratum of muscles arises by a double tendon from the arch of the pubes, and unite under this part of the canal. These are described by Mr. Wilson. (See Med. Chir. Trans. vol. i.) Whether muscular fibres are found in other parts of the urethra or not, it is sufficient for our purposes to observe that such is the elasticity of this membrane that its diameter undergoes very considerable changes, sometimes admitting a large bougie to pass very easily, and then contracting almost upon a thread. This elasticity should not be forgotten when prescribing for stricture. (Monro, vol. iii. p. 13.) The causes of this form of the disease are cold; the excessive use of wine, or a debauch of any kind; the irritation from over distension of the bladder; the irritation of fever; cantharides from a blister; gravel. A case of stricture occurring in a child five or six years old, from gravel, is related by Andrews, in his treatise on strictures. In the adult it is not unusual, especially in winter, particularly from gravel; also in gouty habits from the same cause, especially too in the cold of winter, when an unusual quantity of earthy and saline materials pass by those channels, the kidneys; and when permanent stricture exists, the effect of inflammation and actual thickening of the lining of the urethra, and a diminished

diameter of the canal, these usual exciting causes of spasmodic stricture operate in renewing the paroxysms to which they are liable, and which, like the first, are also spasmodic, though the predisposing cause be a permanent impediment to a free discharge of urine. And I should add, these frequent renewals of irritation in some cases aggravate the original disease, and in some cases altogether close the passage. The remedies to be employed must accordingly vary with the nature and extent of the disease. When a permanent thickening exists in the urethra, and there is danger of a total obstruction, a dilating bougie must be applied, and in some cases the application of a caustic must be introduced. In most instances, even where a degree of permanent stricture exists, you will meet with attacks of a spasmodic nature, and which are relieved by the means of allaying irritation without the introduction of a caustic, or a dilating bougie; and indeed, even, in many cases, without the introduction of a catheter. The remedies I refer to are, venesection; warm bathing; warm enemata; opium; tobacco injections; and injections of oil through the urethra. You may advantageously give the tinct. ferri. muriat. gtt. x. every ten or fifteen minutes. Antimonial medicines producing nausea have also relieved such impediments to the passage of urine.

LECTURE LVI.

CRURITIS, OR PHLEGMASIA DOLENS.

PHLEGMASIA DOLENS is a disease which chiefly affects the lower extremities of lying-in women, and which usually appears a short time after parturition. Hence the various appellations given to it in different countries, as a disease attendant upon parturition, or, as connected with the appearance of the milk and its supposed sudden translation to the limb affected. Dr. White, of Manchester, who wrote the first regular treatise on this subject, denominated this disease, *phlegmasia alba dolens puerperarum*, i. e. the swelling of the lower extremities of lying-in women. The French, too, call it, "*l'enflure des jambes et des cuissés de la femme accouchée.*" By the French also it is sometimes called "*depot du lait;*" and by the Germans, *oedema lacteum*, the milk leg, and *milch streichen*. Dummer calls it the swelled leg; Good, *bucnemia*, of which he makes two species, viz: *bucnemia sparganosis*, i. e. the puerperal tumid leg; and 2d. *bucnemia tropica*, or the tumid leg of hot climates, the Barbadoes leg, or elephant leg; with propriety are both introduced by Good. Dr. White published his inquiry on this subject in 1784; this was the first publication that appeared in the shape of a regularly digested treatise or essay on this subject. It was described by Dioscorides, under the appellation of *sparganosis*, from the verb, *σπαργω*, to tumefy and distend; a term adopted by Good, and appropriated to this affection. Dioscorides used it in a more extensive sense, as applicable even to some affections of the chest. A case of it was described by Rodrigues Decastro, of Hamburgh, in 1603, in which he attributed the disease to the scantiness of the lochia. I may also refer you to the account of the apothecary, noticed by Wiseman, in

1676, or the observations on this subject by Mauriceau, in 1712, and by whom this disease is ascribed to a reflux of the lochia upon the limb—"depot laiteux sur la cuisse." Mesnard, 1743, ascribes it to the suppression of the lochia, and the consequent arrest and coagulation of lymph in the parts affected. (See *Guide des Accoucheurs*. Paris, 1743.) Puzot, of Paris, too, in his works, published in 1759, six years after his death; Levrett, also, in a memoir in the *Journal de Médecine de Paris*, for July; and Astruc, 1761, who imputes it to the lymph being thickened by an admixture of milk, in consequence of which it cannot pass through the glands, but stagnates in them. Sauvages, two years after, in 1763, in his *Nosologie Méthodique*, speaks of it under the appellation of phlegmasie lactée, in his class of cachexiæ, i. e. considering it as one of the vitiations of the system, or vices of the habit. In 1784, a more full display of the character of this disease was drawn up by that able practitioner, Dr. White, of Manchester; since his time we have also the instructive writings on this subject of Dr. Frye, of Gloucester, who published in 1792. Their doctrine, both White and Frye, is an obstruction or other morbid state of the lymphatics of the limb. (See vol. xiii.) Dr. Ferrier, in his *Histories and Reflections*, and Dr. Hull, of Manchester, have also written well. In Dr. Denman's work, too, you find an instructive chapter on the same subject, published in 1800. Hull's theory, in his own words, is this: "The proximate cause consists in an inflammatory affection, producing suddenly a considerable effusion of serum, and coagulated lymph from the exhalents into the cellular membrane of the limb. The seat of the inflammation I believe to be in the muscles, cellular membrane, and inferior surface of the cutis. In some cases, perhaps, the inflammation may be communicated from those parts to the large blood vessels, nerves, and the lymphatic vessels and glands imbedded in them." This is the most correct view. It is, however, a disease not of very frequent occurrence; but it is one attended with so much immediate suffering to the patient, and occasionally is succeeded by so great debility and other diseases, that it demands your attention. Of 1897 women delivered in the Westminster Dispensary, five only were attacked with it. Of 8000 at the Manchester Lying-in Hospital, and at their own houses, only four. Dr. Thomas tells you that in thirty years' practice he had seen but one case, and but two in thirty-five years. I have seen

five cases since the year 1794. It is a disease generally confined to the puerperal state, but not exclusively; most usually so after labour at the full time, or premature labour. Cases are recorded in which it has taken place in young unmarried women; in old women, after the period of parturition, and indeed in old men as well as old women. Mr. Sankey, surgeon, of Wingham, in Kent, relates, in the tenth volume, (p. 401.) of the *Edinburgh Journal*, two cases occurring in young women, not after or connected with parturition. In both, the disease was severe and well marked; in both cases the menses were obstructed, and one had suppression of urine. He also states a well marked case of a man, sixty years old.* His remedies were laxatives, opiates, blisters, first to the calf of the leg, afterwards, every two or three days, higher or lower, according as the pain was situated.

These diseases, Mr. Sankey observes, were never fatal, though oftentimes tedious and painful. In most of his patients, too, he remarks, that both legs were affected in succession. Dr. Thomas saw it in an old woman; and a case is related by Levret, in which the disease took place a year after delivery.† One of the last cases in which I saw this disease, took place twenty-three days after delivery, and several days after the lochial discharges had totally ceased. This is an important fact, and we shall find it destructive of that theory of Dr. Darwin and Mr. Frye, and others, which ascribes the disease to the lochial discharge as attendant upon parturition. A single fact will thus oftentimes vanquish a volume of speculation. For the most part, however, we know that this disease is met with in the puerperal state, though not extensively so. I have accordingly, when describing its characteristic symptoms, remarked that it chiefly affects lying-in women; and I may add, it generally occurs during the discharge of the lochia, say from the fifth or sixth day to two or three weeks after delivery. Dr. Bard states it as taking place from the first or second day, to two or three weeks after delivery.

* Other cases may be seen in the volume of the *Med. Chir. Trans.* for 1819, in which this disease took place in the male as well as the female, and in the unimpregnated as well as the married. (Recorder, No. ix. p. 125.) Case in a male, by Dr. Denmark, *Med. Chir. Journal*, July 1817. In some of these cases they very probably were confounded with ordinary rheumatism, to which they bear close resemblance.

† A case is related by Dr. Dickson in which "the uterine discharges had almost ceased entirely." (*Am. Recorder*, No. 9, p. 115.)

A case is related by Dr. Dickson, as occurring on the fourth day after delivery. (*Am. Recorder*, No. 9, p. 115.) Dr. Denman dates the period of its attack from the fifth or sixth day to the third or fourth week; but he adds that it most commonly occurs between the fifth and twelfth day. Dr. Caspar says from the eleventh to the fifteenth.

We may consider it as an inflammatory disease of the limb or limbs affected. Most usually one limb is affected; sometimes both at the same time; sometimes both in succession. It is usually described as commencing with symptoms of general depression, loss of spirits and great irritability of mind and body, analogous to the depression arising from the poison of typhus fever first acting on the system. Sometimes, says Dr. Ferrier, it is ushered in by chills.

2d. The patient at the same time, says Dr. Denman, feels irritation, soreness, and occasionally pains about the uterus and groins. These symptoms are to be expected in every lying-in woman, and upon every invasion of fever, whatever may be its type. Those symptoms and feelings predict this disease, says Dr. Denman. I say that these uterine and nervous affections sometimes follow the disease; for according to Dr. Ferrier, it sometimes begins not in the groins, but in the knee and legs; and in one case referred to by Dr. Hull, the whole limb was affected at the same time.

3d. The pain is acute and sudden at first, in the calf of the leg, extending to the heel on the inside, and reaching to the groin, observing the course of the lymphatics. The inguinal glands, both the external and superficial, and the internal and deeper seated, become painful, swelled, indurated, and very sensible to the touch. In some cases, both chains of glands are affected. The lymphatics do not always show by their appearance that they are inflamed; but sometimes, according to Dr. Ferrier, this is manifestly the case, and knots are occasionally to be felt in the course of the lymphatics. The limb over its whole surface, especially on the inside of it, becomes very sensible to the touch, and very painful upon the slightest movement, even to torture and fainting, precisely as in the most painful forms of acute rheumatism—as it enlarges it becomes pale and glossy, as in dropsy; and in some cases, such is the congestion that occasionally occurs, the limb becomes as hard as marble. Such is the determination to the

part affected, the countenance, too, is pale, as in other inflammatory diseases.

4th. A manifest increase of fever now ensues, attended with a corded and frequent pulse, as is common in inflammation of the dense or serous membranes. The tongue white, accompanied with great thirst; the skin dry and hot; the limb is also preternaturally heated; the urine high coloured, and soon observed to be muddy and small in quantity, as in dropsy; the belly is costive; the stools of a pale clay colour, indicating the diminished secretion of bile; the secretions are in general diminished; the milk ceases to flow, or is sensibly lessened; the lochia, too, are lessened or checked altogether; or if the discharge be continued, they are offensive, which, it may be remarked, is always the case in a febrile state of body, whatever may be the character of the fever present, whether milk fever or any other.

Dr. Denman remarks that this offensive state of the lochia has frequently been observed to exist in a much greater degree before the attack of this disease than is usual; i. e. I should say, a febrile state in a less degree may exist, rendering the discharges more offensive; or the discharges may have been profuse from other circumstances, and thus be rendered unusually offensive. But it does not follow that offensive lochial discharges beget this disease, as stated by Dr. Denman. This is certainly bad logic. I should just as readily attribute the milk fever to offensive lochia as this disease of the limbs to that source.

5th. The febrile symptoms begin in about twenty-four hours after the pain in the limb begins; the leg and thigh begin to swell; a great determination takes place to the part affected; the whole limb becomes of an enormous size. The swelling having taken place to this extent, the pain abates, probably from compression of the nerves, as in other parts of the body, from plethora; the limb, too, is benumbed and stiff.

Some writers ascribe this change to a rupture taking place in the lymphatics, forgetting that these vessels possess a very remarkable degree of strength; and that even the pressure of a tourniquet never ruptures a lymphatic. They forget, too, their remarkable resistance to the pressure of a column of mercury when forcibly injected into them. Others, too, and among these are Denman and White, suppose that a sort of aneurismal enlargement takes place in the smaller lymphatics, by which they take

off the load distending the larger. This may be proof of the powers of their imagination, but will not be considered as the evidence of the fact. It shows how riotous and maniacal the imagination becomes when a new hypothesis is to be supported.

Another party suppose this rupture or laceration of the lymphatics to arise from the great pressure made upon the sharp edges of the pelvis by the head of the child, and the violence of labour! On the other hand, it is notorious, as Dr. Lowder observes, that this disease takes place after easy labours as well as violent ones.

But the tumour is not exclusively confined to that part of the limb in which the lymphatics abound. The whole limb is involved in the disease, from the very toes to the abdomen, including the labia pudendi, even extending to the nates and loins. The patient is incapable of voluntary motion, in the first stage, on account of the acute sufferings it occasions: in the latter, from the benumbed, paralytic state of the limb.

6th. After eight or ten days an abatement of the most urgent symptoms takes place. The swelling, however, as Dr. Denman observes, to a certain extent, may remain weeks, and even months. In this it is analogous to gout and rheumatism, especially if not actively treated by depleting remedies; and as in gout and rheumatism, the disease, after appearing in one limb, is transferred to the other, especially if the antiphlogistic treatment be not vigorously pursued. In one case, related by Dr. Dickson, uterine hemorrhage supervened, and proved fatal. (*American Recorder*, No. 9, p. 115.) This fact also shows the inflammatory character of the disease, and the increased action it produces in the blood-vessels. In some cases, it is said to have left a permanent disease of the limb, both of enlargement and debility. (See *Med. and Chir. Trans.* Vol. ii. p. 66.) Upon dissection, no change is seen in the bones or muscles, but in the skin and adipose membrane; these were one inch and a half thick; the papillæ of the cutis were sensibly enlarged, as in real elephantiasis. (See *ibid.* p. 70.)

In the case, too, of Mrs. C. the limb remains enlarged; and such is the fulness and tumour, that it is even painful to the touch, though many years have passed since she was affected with the disease. Thomas, indeed, says that the limb seldom, if ever, returns to its former size. This is not true. On this subject he is no authority, for he acknowledges he has seen but two or three cases of it. From the same cause, too, he has been led into the

error that it is a purely local disease, which idea he expresses in so many words. In some cases, too, it is said to have ended fatally. Both Dr. Hull and Denman state this fact. A case is also related, in which it proved fatal. (See *Med. Museum. Communications of the Royal Society at Goettingen. Trans. Vol. i. p. 335. Med. Chir. Trans. Vol. xii. p. 424.*)

These permanent consequences, or fatal terminations of the disease, are certainly of rare occurrence, except as the effects of mismanagement, or the disease occurring under great debility of constitution. In some instances, too, it has terminated in suppuration. (See Hull.) But mostly the disease, like rheumatism, ends in effusion; and after some length of time, a reabsorption of the effused fluid.

CAUSES OF THE DISEASE.

The predisposition to this complaint, particularly in the puerperal state, appears to be the debility of the limb, from the long continued pressure produced by the pregnant womb, and fulness of the vessels resisting the ready return of blood from the lower extremities. A case related in the *Medical Chirurgical Trans. Vol. ii. p. 69*, in which this diseased state of the limb took place after the cessation of the menses, shows the influence of plethora, in predisposing to this complaint. A fact, too, showing the connexion between plethora and this disease, is, that of fourteen cases recorded by Mr. White, eight did not suckle their infants. The general irritability of frame, in the lying-in woman, and of the lower extremities also, in a peculiar manner, renders her liable at this time, to inflammatory diseases. A former attack particularly predisposes to a second.

Most writers appear to agree in the opinion, that the disease has its principal seat in the lymphatics of the limb, or at least that it especially affects those parts. But this, we shall show you, is not the part of the limb primarily affected, and, indeed, that the lymphatics are not necessarily affected, to constitute this disease. Mr. White, one of the earliest writers on this subject, considers the disease to consist in an obstruction, detention and accumulation, of lymph in the limb, and that this is occasioned by accident in labour, or during pregnancy, and that it is peculiar to child-bed. He believes that the head of the fœtus pressing upon the

sharp edge of the pelvis, ruptures the lymphatics of the limb. There is certainly no proof of this. During pregnancy it is well known, that no such pressure can take place; besides, as already observed, this disease sometimes occurs after easy labours, as well as those which are more difficult or tedious; so says Dr. Ferrier. And, if this opinion were well founded, that pressure was the cause, the disease should appear earlier, certainly at parturition or immediately after it, when the pressure had just been experienced; not so is the fact. Besides, no enlargement of the limb followed the obstructed glands in the cases related by Mr. Abernethy, nor does it happen in ordinary affections of those glands. Frye, of Gloucester, in 1792, another eminent writer on phlegmasia dolens, ascribes the disease to obstruction of the lymphatics, produced by inflammation of one or more of their trunks, occasioned by pressure, or by the absorption of some acrid humour. This doctrine, particularly the last opinion, has been adopted by Dr. Denman and by Dr. Bard, that the disease arises from an absorption of the acrid discharges of the uterus, affecting first the glands in the pelvis, and at the upper part of the thigh! There are several insuperable objections to this opinion. Upon this principle it should, 1st. occur more frequently, as such offensive discharges are ever flowing, whereas the disease may be said to be of comparatively rare occurrence. 2d. It should be the attendant on diseases of the womb, especially an ulcerated or cancerous state of the uterus, whereas this does not take place. It has occurred where there has been no morbid action of the menses or mammæ, and so where all the secretions have been flowing in a healthy state in quality and quantity. (See also Good, vol. 2, p. 418.) 3d. The disease should always commence in the groins and about the pelvis. This is not the case. Certainly it generally affects the calf of the leg first; and in the case of Mrs. M. it attacked her twenty-three days after parturition, several days after the lochia had ceased. 4th. Again, Dr. Ferrier states that it exists independently of parturition, that in some cases it is produced before delivery. He believes that it is occasioned by pressure on the internal iliacs, and accompanying veins and nerves, producing lymphatic inflammation, without rupturing the lymphatics, and that the sensibility being greater then than under other circumstances throughout the whole limb, renders it peculiarly liable to inflammation. This is a nearer approach to

the truth than any of the views heretofore taken of this subject. Dr. Thomas also mentions a case in an old woman unconnected with parturition. I have also certainly seen rheumatic enlargements of the limb so like that of puerperal women, that it would puzzle Dr. Denman himself, or any other physician, to distinguish them. Dr. Hull, a still later writer, has generally, in my opinion, taken the most correct view of the nature of this disease. He rejects all the preceding theories. His predisposing causes are two:—1st. increased irritability attendant on pregnancy, and still more so immediately after parturition. 2d. An over distended state of the vessels of the lower extremity and lower part of the trunk. The exciting causes enumerated by Dr. Hull are, 1st. Contusions, or violent exertion of the muscles of the thighs or pelvis; but of these contusions or exertions there appears no evidence. 2d. Plethora, from suppression of the lochia, or the milk; too much animal food, spices, wine, &c. 3d. Food taken too freely—and he should have added, of improper quality—such as is calculated to excite the system. In the case of Mrs. C. it was induced by an error of the physician, directing her to drink two bottles of wine a day, after her lying in!!! It was, in her case, a wine leg! 4th. Standing or walking too much, and too early after delivery.

In these views of the subject, Dr. Hull certainly has enumerated some of the agents concerned in the production of the disease; but he should have added cold, and other causes producing fever. The general and local irritability, both predispose to such inflammation, as well as that of the breasts or the uterus; especially after great distension of the abdomen, and perhaps a violent labour, or in the case I have already referred to, Mrs. M., in which it occurred after the lochia had ceased, the lady had borne two children, and both large. Her labour, too, was severe, and followed with great hemorrhage. In this case great distension, a violent labour, and hemorrhage, all concurred in predisposing to this disease—it was excited afterwards by cold.

The proximate cause, according to Dr. Hull, consists in an inflammation of the limb, producing effusion into the cellular membrane, as the consequence. He supposes, also, a great connexion to exist between phlegmasia dolens, peritonitis, and puerperal fever, &c. This Dr. Thomas denies. The truth is, the same

causes which produce the one will produce the other. So far they are connected.

Dr. Hull relates eight cases, in which no enlargement of the lymphatics whatever occurred. He therefore very properly considers the lymphatic obstruction as a consequence, not as a cause, and therefore not necessarily a part of the disease; and which he considers to be an inflammatory affection of the limb, and that this effusion of coagulable lymph takes place in this as in other inflammations. Let me repeat the idea I have already expressed, that in the lying-in woman there are three parts of her system more irritable than the rest, and consequently more liable to become the seat of disease; viz. the uterus and peritoneum, the breasts, and the lower extremities. The limbs, I may add, appear to be the least liable of the three to be affected; consequently this disease is of more rare occurrence than either affections of the womb or of the breast.

The predisposition insisted on by Dr. Ferrier; viz. an interrupted circulation, and increased irritability, is doubtless correct. This irritability, in consequence of weakness, is denominated by Mr. Hunter, "the stimulus of relaxation." It is particularly illustrated in this disease, for the vessels of the limb having lost their distension, which they possessed during pregnancy, are now peculiarly languid in the circulation of the blood; accumulation is the result, and inflammation. But this relaxation is not confined to the lymphatics, as supposed by many; and I observe, too, by Dr. Good. (See p. 477.) And it is very possible, that the exciting causes, mentioned by Dr. Hull, are correctly stated; but to those should be added cold, which I believe to be the most frequent of all the exciting causes. In one of the cases I saw, it came on manifestly thus excited. It came on with cough, fever, and chill, affecting the chest with difficulty of breathing, inso-much that her friends were all sensible of her having taken cold. The same thing appeared in one of the cases, related by Dr. Davis—the woman died—the chest was in a state of inflammation as well as the limb. (Med. Chir. Jour. vol. 12.) It soon, by metastasis, seized the lower extremities, where it was exclusively confined. In all it appears in the usual way. Ordinary inflammatory diseases appear, and with chills. Dr. Ferrier also states some cases of this disease to be manifestly thus produced. Dr. Hull relates the case of a corpulent man leaping from a high fence, being thus

affected by mechanical injury. Dr. Ferrier, too, notices a case occurring spontaneously in a man of full habit of body, who was subject to frequent bilious attacks—both probably from the same cause, plethora.

TREATMENT.

The remedies to be employed must be general and local. Venesection is called for, but is to be used cautiously. Emetics also are useful in this complaint, as are also cathartics, especially the saline purgatives, and enemata. Sudorific anodynes are called for, such as the Dover's powder, and the spiritus mind. and laudanum. Diuretics also may be advantageously used; and among the best of these are calomel and squills. Begin with one grain of each, night and morning, or three times a day, aiding the operation of the medicine by diluent drinks. The tincture of the *colchicum autumnale* may probably be usefully prescribed in this affection, as well as in gout and rheumatism, and especially in its first stage.

The local remedies must consist chiefly of warm fomentations of vinegar and water, or of poppy heads steeped in vinegar: leeches, cupping, blisters, or issues. Soft poultices, too, will be found useful, applied morning and evening.

But when the febrile symptoms have abated, and the local inflammation has disappeared, there remain only debility, and perhaps œdema. Then apply a flannel roller to the limb; and use spirituous, and other stimulating applications, to the part. Use friction with the flesh-brush or the hand. This is especially important to excite the languid circulation in the vessels, and to give tone and activity to the absorbents.

Frye recommends the mercurial ointment; and others small doses of calomel. These, however, should be avoided in the first stage, especially if the patient is much enfeebled. Dr. Good observes that he has seen them produce great mischief in such cases.

The diet and regimen must be regulated upon the principles observed in the other phlegmasiæ. With these you are now well acquainted.

LECTURE LVII.

RHEUMATISMUS VEL MYITIS.

RHEUMATISM, the myitis of Crichton, thereby denoting the seat of this disease to be chiefly in the muscles. By Dr. Parr the old name of arthritis is retained, which by the ancients was applied both to gout and rheumatism. It is important that they should be separated, both as it regards their nature and their treatment. With this view too, Dr. Parr annexes to the term arthritis, the adjunct rheumatismus; gout he calls arthritis podagra. I have retained the term rheumatism, as pretty generally agreed upon among writers. It is so called from rheuma, (from the verb ρεω, fluo,) denoting a defluxion on the part affected; and answers the purpose as well as any other name proposed; and has this advantage, that it is well understood. Dr. Cullen's definition contains many details, viz. "*morbis ab externa, et plerumque evidente causa; pyrexia; dolor circa articulos, musculorum tractum sequens; genua, et reliquos majores, potius quam pedum vel manuum, articulos, infestans, calore externo auctus.*" He intends by the first part of this definition to distinguish it from gout; but this is not the place for diagnosis. A definition should contain only the characteristic symptoms of a disease. The first part of his definition is not invariably true, that it proceeds, (in all cases,) from an external cause; nor is the last uniformly true, that it is increased by external heat. Besides, these circumstances are equally true of any of the phlegmasiæ; they are applicable to gout as well as to rheumatism, for gout frequently, like rheumatism, is excited by cold; and, like rheumatism, is increased by heat. Rheumatism, acute, Dr. Home observes, is more frequent in summer than winter; attacks more

females than males; that it is rather a nervous than inflammatory disease; that antispasmodics are most effectual in curing it, but, by the by, venesection is the best antispasmodic; that of twenty-two patients in the infirmary with it, sixteen were females; that he has more in summer than winter; but his observations are made at the infirmary. Query: Are there not some circumstances probably overlooked, which, will otherwise account for these occurrences, so contrary to general observation? That it is not the heat of the bed which aggravates the disease more at night, but what he calls a nocturnal paroxysm, observing that the patients with it are always in dread. This same remark will extend to most inflammatory diseases.

Another exception to Dr. Cullen's definition is, that it is not confined to the joints: on the contrary it frequently affects the muscles of the head, of the chest, of the abdomen, and even the viscera, as well as the joints; and it affects the small joints as well as the larger. I know a lady, afflicted with a rheumatism, who had large deposits of chalky matter, similar to those of gout. Dr. Gregory has also frequently made this observation, that rheumatism affects the small as well as the larger joints; that he has seen the fingers crooked with it, and then of course incurable. Dr. Cullen, therefore, should have added the qualifying expression, "*plerumque*," after "*dolor*." Indeed, rheumatism might be defined to be an inflammatory disease of the muscles, (including their fasciæ, or inclosing membranes,) and the membranes composing and surrounding the joints. And like the inflammation of some of the viscera, it might also admit of the distinction into membranous and parenchymatous, showing by the former, that the disease is more immediately seated in the membranous portions and coverings of the muscles, and of the joints; and that the latter more especially affects the strictly muscular and cellular portions of the muscles; and in which the pain and febrile symptoms are relatively less acute, which sometimes terminates in abscess. In the definition in my nosology, I have accordingly adverted to these particulars. Read there my definition of rheumatism. In my definition of species, I have complied with custom in dividing it into acute and chronic. Yet I wish it to be understood that I consider chronic rheumatism, as chiefly the sequela of the former; a morbid sensibility that remains in the part after the acute or febrile rheumatism has run through its

course, and the evidences of general excitement have subsided, as scirrhus succeeds to inflammation. Accordingly Dr. Cullen places chronic rheumatism under a distinct head of arthrodynia or pain of the joints; and considers it, very properly, among the consequences or terminations of rheumatism; and which he thus defines: "Post rheumatismum, nisum violentum, vel subluxationem; dolores artuum vel musculorum, sub motu præsertim, aucti plus minusve fugaces, calore lecti vel alio externo levati; artus debiles, rigidi, facile, et sæpe sponte frigescenter; pyrexia nulla; tumor plerumque nullus."

Some allege that rheumatism sometimes takes place from the presence of an inordinate quantity of lithic matter in the system. The phenomena arising from this supposed cause, are more satisfactorily to be explained by the interrupted state of the excretions, and the febricula such interruption produces, attended with pain, and other irritations of the debilitated sensitive system; for these occur most usually in advanced life. And from the same causes, the impaired state of the excretions, we may account for the inordinate deposit of earthy matter in different parts of the body.

The symptoms of accute rheumatism are those of the phlegmasiæ in general. It usually comes on with chills, succeeded by great heat, with pain in the limbs, changing its seat from one joint to another, and is especially increased by the heat of the bed, and occasionally attended with great soreness to the touch of the surface as well as of the internal parts. The pulse is hard and frequent; the tongue white and furred, with great thirst. The secretions are generally interrupted; the urine appears pale; afterwards becomes high coloured, depositing a large lateritious sediment, as in gout; but the patient still is not relieved. Indeed we shall find that gout is rheumatism in the small joints; and rheumatism is gout in the muscles and larger joints, though usually proceeding from different causes, and occurring at different periods of life. Stoll mentions that they are only varieties of the same disease. (*Rat. Med. Part 3, p. 137, 430.*) And Bergius believes that they are convertible diseases. The fever continued, and a direction of the fluids taking place to the limb, or parts affected, swelling ensues, oftentimes resembling that which is attendant upon the cruritis or phlegmasia dolens of lying-in women; and, like that, affording the patient some release from his

sufferings; for the pain is frequently suspended by the pressure upon the nerves of the limb. This disease occurs at those seasons of the year which are most changeable, as the spring and autumn, not so much so in the uniform and steady cold of winter, nor in the warm seasons of the year, or in warm climates, with the exception of bathing in cold water when heated, or lying on the damp ground when the body is perhaps under excitement. But in the country it is relatively a disease of frequent occurrence, owing to the moisture of the earth, and of the atmosphere, to which the inhabitant of the country is exposed.

Its terminations are, by resolution. Sometimes metastasis, as to the head, the lungs, and the heart, especially where the practice is feeble. (See Bedingfield, p. 307.) Abscess sometimes. More commonly in a gelatinous affusion; and in deposits of earthy matter. In this it differs from many, nay most of the phlegmasiæ, except it be the gout, to which it is most nearly allied. When it ends by resolution, I have known a case where it assumed the intermittent character, the pain returning at a regular hour upon alternate days, but with very little fever. This is called by Alibert, the rheumatic form of intermittent.

DIAGNOSIS.

It is distinguished from gout by the cause and time of life. The ancients knew nothing of rheumatism, as distinct from gout. Sydenham was the first who made the discrimination. He had experienced gout himself, and saw rheumatism in others. Boerhaave too had rheumatism eight months. The best account of it is in Van Swieten's Com., a book shamefully overlooked.

Gout usually appears after thirty-five; rheumatism before that period of life; sometimes at five or six years of age. Gout most usually arises from the sanguine and plethoric habit of body and free living.

Rheumatism from cold. In rheumatism, too, the fever is continued. In gout, most commonly, it intermits; at least a sensible remission is apparent. In gout the stomach is principally affected; not so in rheumatism.

Nephritis is distinguished from it by the peculiar symptoms that attend upon the organ diseased, as connected with the stomach, the testes, and the round ligaments. Boorhaave, strange to tell, in

his own case, committed this error by confounding nephritis and lumbago!! Bending the body alone, in nephritis, should decide it; whereas in lumbago the body cannot be bent without great suffering.

Hydrargyria is another disease, produced by mercury, that is very similar in its symptoms, but differs only in its cause. Indeed in the relaxed state of the exciting and sensitive condition of the nerves, it is not improbable that cold, in most cases, produces it, even though mercury be acting on the system.

"A course of mercurial medicines," says Heberden, "has, with great reason, been suspected of bringing on something like this distemper (chronic rheumatism) in many persons; and it has appeared to do so in the same person five or six times; i. e. as often as the mercury was repeated." (Heberden, p. 501.)

Arsenic too produces rheumatism, whether directly or by adding to the irritability of the system, is not so easily decided. In those countries where it is much employed in the treatment of fevers, rheumatism is of frequent occurrence.

PREDISPOSING CAUSES.

1. Fulness of habit by creating an inflammatory state of the system. Sir Clifton Wintringham remarks, that those who have undergone amputation of a limb are thereby predisposed to this and other inflammatory diseases. G. M. lost a limb. He afterwards became plethoric, gout followed; and from this disease he suffered severely, notwithstanding the anticipations of the person who congratulated him upon the cost of his limb, believing that God had great things in store for him, by taking away one of his legs. Upon this occasion, he addressed Mr. M. very earnestly. Mr. M. replied, "Sir, you really speak so eloquently upon this subject, and hold out so many blessings for me, in consequence of the loss of my one leg, I am almost induced to lose the other also." (Comm. de Morb. Quibusdam, Art. 79.) But to return:
2. A sanguine temperament. 3. Vigour of early life; i. e. from childhood to thirty-five. The young, the vigorous, and the active. Hence, too, we infer its inflammatory character, independently of its symptoms. 4. Intemperance will predispose to it. 5. A former attack, by which the parts affected are rendered very sensible to the exciting cause.

EXCITING CAUSES.

Cold, heat, or the two alternately applied; violent exercise; change of dress; intemperance; wet clothes; cold bathing when heated.

TREATMENT.

Venesection, general, repeated three or four times. As Dr. Gregory used to remark, there is very little danger, as it regards the patient's life, but he is in great danger of losing the use of his limbs if you do not industriously cut off the flow of blood to the inflamed part. Gregory's bleedings were too small; viz. about $\frac{3}{4}$ xij.; hence he found it necessary to repeat them. Local, by leeches; cupping repeated, not regarding the buffy coat, for the buffy coat exists in the last stage as well as the first. Thomas remarks, that in rheumatism the buff increases as the disease advances. So also in intermittents. (p. 157.) Dr. Gregory makes the same remarks. Even after one hundred and seventy ounces have been drawn, the disease has, in some cases, been unsubdued. This treatment was therefore condemned as erroneous by Dr. John Fothergill, and by Dr. Haygarth, who then prescribed the bark! Fordyce, too, came into their views. (See Thomas, p. 186. See also Clin. Hist. of Diseases, Edin. Journal, Vol. 1, p. 482.)

Saline purges—A course of James' powders. Sudorifics—Warm bath; fomentations; sinapisms, moxa. Blisters—Ointment of tartarized antimony. Liniments—volatile; camphor, dissolved in oil, or the volatile liniment, preferred by Dr. Good to the spirituous liniment, which he supposes to dry the skin too much; which heats and stimulates without exciting moisture; a waistcoat of coarse, brown sheathing-paper produces a diaphoresis, and excites by the tar with which it is so largely impregnated; oiled silk. Diuretics—Nitrate of potash. Dr. Brocklesby's great remedy was nitre Dr. Kuhn's also. It was combined with the tartrate of antimony. Digitalis has also been by some recommended on account of its diuretic properties.

Anodynes are very proper after the inflammatory state has been subdued by depletion; in that case, Dover's powders may be very beneficially prescribed. It was in this disease that Dr. Dover first introduced this valuable combination of opium, ipecac-

uanha and the sulph. of potash. He became celebrated in early life as a captain of one of the privateers in Queen Anne's time, that sailed round the world. In the last of his life he distinguished himself by the introduction of this powder; and by another practice he introduced, of giving crude quicksilver—he took it himself in large quantities, and became so attached to it that he said, if he could afford it, he would swallow a pound of quicksilver daily—the facetious Dr. Dover, as Fuller calls him. Garthshore and Sir John Pringle as well as most practical writers, concur in the approval of this sudorific anodyne, which preserves a pervious state of the skin, at the same time that it allays the sufferings of the patient—It should be renewed every three or four hours, until sweating is produced—renew it in twelve or twenty-four hours to continue the sweat. *Rhododendron chrysanthemum* of Linnæus, also once much in use, both in gout and rheumatism—a native of the snowy Alps and mountains of Siberia—in Russia also much employed, says Dr. Guthrie. (Med. Comm. vol. 5, p. 434.) Three or four doses generally giving relief. (See also Pearson's Mat. Med. Home's Clin. Exp.) Another remedy that has come into use in acute rheumatism, is the Peruvian bark. Dr. Haygarth, Dr. Fordyce, and Dr. Duncan, as well as others, viz: Sir Geo. Baker, Dr. Heberden, Dr. Saunders, Dr. Willen, Sir Lucas Pepys, Dr. Lettsom, Dr. Aikin, and Granger, are the advocates of this practice. (See Med. and Surg. Remarks.) Dr. Haygarth introduced it as early as 1772. In the hands of others it has not been prescribed with equal success—on the contrary, with decidedly injurious consequences. Dr. Cullen had reason to think it injurious. Dr. Haygarth was so convinced of its superior efficacy, that he thought the bark did not cure an ague so quickly and so successfully as it does acute rheumatism!! Dr. Gregory disapproves of it in the first stage—in the greater proportion of the cases it did no good. He observes, it is well to keep it in view, especially in cases where you fail to effect a diaphoresis; this last is questionable practice. Bedingfield observes that it is generally injurious in rheumatism. Thomas uses it but in combination with nitre. I have seen it prescribed by Dr. Duncan, in the Infirmary of Edinburgh, in several cases, with the most favourable results, while in others, with an aggravation of the disease, altogether depending on the stage of the disease and the habit of body in which it was administered. It is the want of attention to these

particularly, and the want of discrimination on the part of the prescriber, that has led to these different and opposite results that have been noticed by practical writers. When the disease is attended with the symptoms of active inflammation and general excitement, the bark as well as other stimuli, must be injurious. But there are cases wherein local inflammatory symptoms may be continued after the general excitement is taken off, that is, partial excitement continues. The effect of increased sensibility of the part, attended with a small pulse, cool or cold extremities, and the general powers of the system greatly impaired and reduced by the depletion the patient has undergone. Thus we often see a headache, a sore throat, an inflamed eye, or other local affection, are sometimes thus continued, that is, by the stimulus of relaxation, as Mr. Hunter calls it; in other words, irritability or susceptibility, which is only relieved by tonics and stimulants that shall distribute that excitement throughout the system, and which at the same time shall diminish the sensibility of the part affected; so of rheumatism. There are cases where stimuli are especially useful in this way; and in like manner, there are cases where the sensibility of frame is such that even the whole arterial system shall partake of it, and a degree of fever be produced that as in typhus, hectic, scarlatina, and other fevers, is only to be counteracted by stimuli and tonics. In such cases the bark may diminish both pain and fever, by imparting tone to the system, and thereby lessening sensibility which is frequently the accompaniment of weakness. In cases of this nature, however, much discernment and practical observation are required to know when the depletion is to be persisted in or tonics and stimuli are to be administered.

The diet should be the strictest abstinence during the synochal stage of rheumatism. No animal food in any shape—on the contrary, a cool, spare diet; milk whey, buttermilk, ripe fruits, gruel, panada, rice, &c. I have known the obstinacy of patients and their friends, in this disease, by the use of animal food, to render all that had been done of no avail, by the excitement being renewed by the use of animal food. Diluents—mineral waters. Regimen—do not load the patient with great quantities of clothing, or bedding. Flannel or cotton next the skin are assuredly necessary and proper; but great care to avoid abuse as to their quantity.

We now proceed to notice that form of rheumatism which is called chronic, the arthrodynia of Dr. Cullen. For the most part, as already observed, this is usually the consequence of preceding attacks of the acute or inflammatory rheumatism; and is continued as the effect of great sensibility of the part, and of the whole system. In some cases the secretions are checked, accompanied with a slight degree of fever. Aged persons thus are frequently affected by pain connected with some febrile symptoms induced by a constriction of the surface, or perhaps by debility in the extreme vessel. Not unfrequently, too, they are the effect of local injuries, as violent exertions, falls, strains, or bruises of the muscles or joints, to which the aged are particularly exposed. In those cases, mild evacuations by the bowels and the use of some diaphoretics will be at first proper; but as soon as fever is altogether removed, as in the last stage of acute rheumatism, stimuli are called for, especially such as are calculated to preserve an open state of the surface of the body. The Peruvian bark is had recourse to by some, bitters by others; chalybeates, in the form of chalybeate waters, or iron in substance; given in the tinct. volatile ℥ii. ter in die in milk, decoction of the woods, with camphor. *R.* guiac ℥vj., camphor ℥i., opii ℥ij., tart. emet. ℥i. *M.* divide in pill 120—two to be given three times a day. Turpentine in form of the oil ℥i.—℥i. of honey, a teaspoonful occasionally. Local stimulants—plasters, the emp. calidum, pix burgund., tart. emet. ointment, the Hungarian plaster. Liniments—soap lin. with aq. ammon. aa. ℥ij., turpentine, essence of mustard, stramonium ointment, spirituous baths, hot baths—106° Fahrenheit—friction with flesh brush, flannel. This was constantly the practice of the Greeks and Romans; the Chinese, too, in health, to prevent disease. The Emperor Augustus, it is said, was so completely curried that his skin exhibited the effects of the instrument. Flannel shirts,* bandages, rollers, knee cap. (See Balfour on bandages in rheumatism. *Med. Repertory*, vol. 6. p. 19.) A slight mercurial action in the system is recommended by Bedingfield, by giving calomel ℥i. twice a week. The dracontium fœtidum, or the skunk cabbage, is advised by Dr. Thatcher, in his medical practice; of the dried root he ad-

* A flannel shirt, Dr. Gregory used to tell us, was worth half a dozen of any other remedies in this disease.

ministers xx. or xxx. grains, three or four times a day, or an infusion of it. *Phytolacca decandra*, or poke weed, has been recommended, in the form of an extract from the leaves, or of a tincture of the leaves. *Tinct. colchicum* is also advised.

The diet should be generous, such as wine-whey, porter, animal food. Condiments, as mustard-seed, horse-radish, cayenne, &c.

REGIMEN.

Let the dress be flannel, frequently changed; exercise, especially a journey. If confined to a chamber, the dumb bell, that is, a mass of metal with a rope fastened to it and passing it over a pulley, pulling it up and down, as in ringing a bell.

LECTURE LVIII.

GOUT, OR ARTHRITIS.

WE now come that disease of fashionable life, the gout, or as it is usually denominated in medical language, podagra, a term derived from and compounded of two Greek words, *πους*, the foot, and *αγρα*, a seizure, denoting the foot as the chief seat of its attack. It was with much more propriety, called by the ancients, arthritis, which signifies inflammation of any joint; a term which I like much better, and have adopted. The ancients called all kinds of pain in the joints or the external parts, by the common name of arthritis; the word rheumatism was not then known. The French, in the 17th century, gave the name of rheumatism to the pains affecting the muscles of the neck, shoulders, chest, and limbs; but those affecting the joints themselves, they called arthritis. Sydenham drew the best description of gout; he himself being a sufferer from it. Cullen has copied him. The ancients, under the general term of arthritis, embraced a great variety of names denoting the joints and parts more particularly affected. Thus they denominated it when seated in the feet, podagra; hands, cheiragra; elbows, pechyagra; knee, gonagra; jaws or teeth, dentagra; joints of the clavicles, cleisagra; shoulders, omagra; spine, rachisagra; large tendons, tenontagra. The English word gout, is of French origin, from the term *goutte*, a drop, because it was at first supposed that a peculiar humour was deposited or dropped upon the part affected, and that gradually, or guttatim. It was first used by Rudolphus, a Dominican of the thirteenth century. We shall make use of the term arthritis, as not designating any particular joint, at the same time that it will

direct our attention to the whole system, instead of a particular part, as the term *podagra* imports. This disease is one of so frequent occurrence, and is attended with so many formidable diseases as its accompaniments and its consequences, that it in a particular manner claims your attention. I call it a disease of fashionable life; that is, it is connected with ease, indolence, luxury, and those habits of intemperance, both in eating and drinking, which we find in the higher conditions of society; indeed the very first subject of this disease, of which we have any record, was a king. We are told in the 15th chapter and 23d verse of the first book of Kings, that Asa, king of Judah, in his old age, was diseased in his feet; and I believe most of the commentators concur in supposing his disease to be the one now under consideration, for there are few other complaints to which the feet are so liable, in advanced life, as the gout or rheumatism, or perhaps dropsy, one of the consequences of those inflammatory affections. It appears, too, that Asa was very severely attacked, for it proved fatal to him. In the second book of Chronicles, chap. 16, and the 12th verse, it is again stated of the same king, Asa, that in the thirty-ninth year of his reign, he was diseased in his feet until his disease was exceeding great, yet in his disease he sought not to the Lord, but to the physicians. The next verse tells you that it proved fatal to him; that he slept with his fathers in the forty-first year of his reign, that is two years after his attack. They certainly at that day did not know much of the lancet. Hippocrates, too, speaks of it as a disease familiarly known; he considers the cause of it to be a mixture of the bile and the phlegm, and that these, put in motion, are deposited in the joints—no unnatural idea, seeing that the subjects of it are generally full habited, and the secretions copious, bilious as well as others. Galen also gives a still more minute account of it, calling it a defluxion in the part affected. Aetius also speaks of it. So that we have reason to infer that ever since eating and drinking have been in fashion, gout has been in the train of ills that have followed excess.

Dr. Cullen thus defines the gout: "*Morbus hereditarius, oriens sine causa externe evidente, sed præunte plerumque ventriculi affectione insolita; pyrexia; dolor ad articulum et plerumque pedis pollicis, certe pedum et manuum juncturis potissimum infestus; per intervalle revertens; et sæpe cum ventriculi vel aliarum*

internarum partium affectionibus alternans." I believe it is not correct that gout is an hereditary disease, essentially so, allowing even that the predisposition is hereditary; for it is in some cases doubtless engendered in the descendant, whose parents had not the least pretensions to this disease; besides it sometimes appears after a manifest exciting cause, as local injury. Dr. Stoll, of Vienna, I believe, first divided it into hereditary and acquired gout; you recollect I told you yesterday he considered gout and rheumatism the same disease. For my own part, as far as I have seen the disease, I only consider gout to be hereditary as far as a sanguine temperament, vigorous constitution of body, fortune, manner of life, luxurious living, habits of intemperance, a full wine cellar and indolence are hereditary. So far, gout is hereditary, the predisposing causes being so; but the predisposition exciting the disease does not necessarily follow: the disease itself must be created, must be earned by the descendant, the usual exciting causes must be applied, it is not an exclusive patrimony. But let us take a view of the facts upon this subject, as they appear at the bed-side. This disease is attended with a synochal or inflammatory fever, with symptoms of inflammation in the part or parts affected, and that whether the disease occurs in early or advanced life.

1. This disease usually occurs after the thirty-fifth year; from that to fifty. Rheumatism, as we have seen, generally appears between puberty and thirty-five, in the greatest vigour of life—gout after that period—so that we may say, where rheumatism ends, gout begins. I told you that there are cases of rheumatism in early childhood; so there are exceptions with regard to gout; I have known it as early as sixteen. Dr. Heberden never saw a case before thirty-five. (*Commentarii de Morbis*, p. 33.) In such cases it is induced by early dissipation; in other words, premature old age. The celebrated John Randolph, of Virginia, was an example of the early appearance of this disease. He was a lad of very extraordinary talents; his society was courted, even when at College; not merely from his parents' importance, but his own precocious merit. He thence acquired the habits of a man, and at the table kept pace with his elders in passing the bottle and other luxuries, at the same time that he indulged in late hours. The consequence of this inordinate and premature excitement was a fit of the gout. It is also to be observed that he did not take the usual exercise and amusements of boys, but confined himself to

his chamber, and general reading, of which he was particularly fond. I have seen another young man, at about twenty-four, affected with this disease, the effect of intemperance, both in eating and drinking. But for the most part this disease takes place in the downhill of life, when the vigour of the system is in some degree giving way; when the arterial debility, the venous plethora, begins to exhibit itself, say after forty—but according to the mode of life, as it regards temperance and exercise, it appears later or earlier in life. Sir Isaac Newton had his first fit of the gout about eighty, and a second in his eighty-fourth year. (See Thompson's History of the Royal Society, p. 284.) He also had a stone in his bladder, which destroyed him soon after eighty-four. Dr. Franklin, too, had both stone and gout, which are not unfrequently companions, being both connected with a full habit.

2. Gout also generally attacks the plethoric habit of body—those who are in habits of great intemperance, both in eating and drinking; those who lead lives of great inactivity and indulgence, all of which are favourable to such fulness of the system. Garth, who was a physician as well as poet, well remarks of the causes of gout and other chronic diseases,

“Thou well canst boast thy numerous pedigree,
Begot by sloth, maintained by luxury.”

On this last account, sedentary and literary characters are frequently the subjects of this disease. Milton fell a victim to gout in his sixty-sixth year. (See Rees's Encyclopedia. See also Gannett's Lect. on Gout. p. 257.) Hence, too, it is the effect of the excessive use of spirituous and fermented liquors. On the same account it is considered as produced by the free use of animal food, and of the condiments of the table, which excite both the appetite and the digestive powers, and thereby create this inordinate fulness of the habit.

It is from the same cause we meet with this disease most usually among the wealthy, who can afford those luxuries, and that ease and indulgence we have spoken of; for it is not usually to be found among the poor and the industrious portion of the community. Plethora of purse, and plethora of body are usually associated in the production of gout; while poverty and labour prove both its preventive and cure. Hoffman has justly remarked that many have lost their gout with their fortunes. Analogous to the effects produced by starvation, upon the patients of Tippoo

Saib, before referred to. Van Swieten relates an anecdote of a fat priest who enjoyed a good living, and had been a constant sufferer from gout. He was captured by the pirates of Barbary and obliged to work two years in the galleys; but he was cured of his gout, and lived free from it many years afterwards. This view of the subject, too, explains another fact, that persons who do not have their regular fits of gout, have some other disease connected with and arising from fulness of habit. Dr. John Gregory was found dead in his bed, probably from apoplexy. Dr. John Gregory died at the age of forty-nine; born June 3, 1724, died Feb. 9, 1773. But let us not, with some physicians, call it gout in the brain; we may just as well call hemorrhoids or an abscess or fistula in ano, gout in the anus, because fulness of the blood-vessels gives rise to these diseases. He had had no fit for the three years preceding his death; his mother, also, from whom he inherited his sanguine temperament, and predisposition to diseases of an inflammatory character, also died suddenly in, 1770, while sitting at table. Dr. Cullen observed that he had known about twenty persons die suddenly, more than half of whom were of gouty habits. Others again of such temperament and fulness of habit, instead of apoplexy, suffer affections of the lungs, such as asthma, or they are attacked with hepatitis.

In other cases, this plethora relieves itself by eruptions, erysipelas, or perhaps abscesses and ulcers—so with pampered horses in the spring. Indeed the fit of gout itself is sometimes announced by eruptions, especially about the head, or upon the lower extremities. G. M. always noticed the eruptions on the head, and the separation of the cuticle, in the form of dandruff, as the forerunners of his paroxysm of gout.

SYMPTOMS OF GOUT.

Besides the symptom last mentioned, it may be remarked as premonitory of gout, that previous to an attack, “both body and mind are oppressed,” denoting the fulness of the system. It comes on with the ordinary symptoms of pyrexia; affecting, more or less, the whole system, the head, the stomach; and sometimes it comes on with inflammatory symptoms, affecting a particular part of the body, unconnected with the usual seat of the disease. General M—n, upon one occasion was attacked first

with ophthalmia; but instantly, by the use of the pediluvium, the eye was relieved, and the foot swelled. The same thing took place with M. who had an inflammation of both eyes, which were relieved by the inflammation of the great toe. (See Johnson on Gout, p. 7.)

Van Sweiten relates a case of pleurisy, which, on the fourth day, was instantly relieved by the coming on of gout. Madness is relieved in a similar manner by phthisis and the itch, and by gout. (p. 8.) Accident, too, sometimes decides the part attacked. A gentleman was subject to the gout, affecting the foot and great toe; but upon a particular occasion, owing to the accident of his horse falling with him, he injured his knee. His knee afterwards, for some time, became the seat of his disease; but within a short time before his death the current took a new direction to his brain, producing apoplectic convulsions. He has since died of this disease; and, as frequently happens to apoplectics, he was seized in his privy, where he was found in a state of insensibility. Sometimes gout appears in the form of rheumatism, in its first attack; but ultimately fastens on the great toe, the ankle, the knee, shoulder, elbow, wrist, or joints of the fingers. Most usually, however, it affects parts previously the seat of the disease. In some instances it affects one part, and leaves it for another. The symptoms, too, are most troublesome at night, and when the sufferer is warm and under the influence of the nocturnal exacerbation in bed. During the day he is comparatively comfortable. Pulse frequent and hard, as in the phlegmasiæ in general. Tongue dry, clammy and furred, with thirst. Respiration hurried. Skin dry with great heat, and burning in the hands and soles of the feet. The usual moisture of the feet disappears, but at the end of the fit this discharge is restored, and the skin becomes soft. The urine pale, and at first diminished in quantity; but becomes high coloured as the disease advances; and after the fit it becomes muddy, and deposits large quantities of uric acid like vermilion, and attaching itself to the sides of the pot. By this appearance, this brickdust sediment, they know the fit has terminated, or is at its crisis. The belly, too, is costive. In some cases a more abundant discharge of fœces takes place a day or two before the fit, and the fœces, too, are more than usually fœtid. Is this the effect of the impaired state of the digestion, which usually precedes the fit, in which case the fermentative process predomi-

nates, and the putrefaction of course, in the lower bowels? Probably this is the true solution of the fact.

Is this owing to the checked state of the excretions by the skin in the commencement of the disease, and thereby impairing the quantity of the secretions by the febrile state induced? As in the more offensive discharges of women about to be, or rather when they are first attacked with phlegmasia dolens, as observed by Denman:—as we observed yesterday, was the case in the changes produced by fever upon the lochia in the forming stage of phlegmasia dolens.

Is this quickened action of the intestines the effect of the derangement in the digestive organs that usually ushers in a fit of gout? or is it owing to the general excitement of the whole system, quickening that of the intestinal canal? or is it owing to the morbid appetite in the commencement of febrile diseases that induces the person so affected to take in more food, which thus increases the peristaltic motion of the intestinal canal? When the fit has thus commenced, if active means be not employed, this febrile state of body and inflammation of the part will continue for many days and sometimes weeks; accordingly some of my friends who leave the disease altogether to nature, and decline all medical prescription, aware of the length of confinement, prepare themselves and their apartment, make ready their flannels and other articles of dress as much so, and with as much solicitude as any lying-in woman. The part affected soon begins to swell, attended with great itching, throbbing pain, which at night, when the excitement of the system is increased, becomes excessively painful. Sydenham compares the pain of the foot to the sensation occasioned by a dislocated bone; and again to the feeling that would be excited by a stream of hot water upon the parts affected. Some compare it to the gnawing of a dog, the pressure of a vice, or the pain of the actual cautery; this probably is not far from the truth, judging from the anecdote I have heard of a man subject to gout. This man falling asleep, barefooted, before a large fire, the fire fell, and a large coal found its way to his foot—half awake and half asleep, he cried out, there's that d—d gout again! He at length awoke, when he found a large coal frying his great toe. The sensation of the two evils was probably the same. The ordinary mode of treatment pursued, too, is calculated to increase the flame. I refer to the practice of wrapping up the limb in

flannel and cotton, which by the accumulation of heat, cannot fail to aggravate the disease. At the same time they make use of wine and other stimulants for the purpose of keeping it there, as the knowing ones express themselves. They are right in this to a certain degree; for if they do not deplete the system, they may certainly expect it to appear in some other part of the body, and perhaps a more dangerous part too, when the disease retires from the part first affected, especially if they may have been inclined to affections of the stomach, the lungs, or the head, analogous to what we have seen in other inflammations. With some, too, it is the practice to use cold applications, to immerse the foot in cold water—the consequences just noticed, may now be expected; I mean the transfer of the inflammation to some other irritable organ. Dr. Good, too, I perceive, has adopted this cold water system, as applied to the feet upon the coming on of gout!!

In urethritis, make use of lead, and a swelled testicle follows; repel the eruption from the surface in small pox, or measles, enteritis, gastritis, or pneumonia, or tetanus succeeds. In like manner drive away the inflammation of the feet, you perhaps produce gastritis or phrenitis. In the regular fit of gout the part affected becomes swelled and inflamed, succeeded by desquamation of the cuticle—an œdema of the lower extremities, by effusion into the cellular membrane, and sometimes by earthy deposits in the part affected, which are at first fluid, but afterwards the thinner fluids being absorbed, the earthy matter or chalk remains behind, producing very considerable enlargement of the joints. So in like manner, it affects the wrists and fingers as well as the toes, and sometimes between the cutis and cuticle. See Moore on gouty concretions or chalkstones. (Med. and Chir. Trans. vol. 1. p. 112.) Mr. Watson (see Med. Comm. vol. 1. art. 3.) relates the case of a man who, when he played at cards, was in the habit of scoring his game with his knuckles. See also Parkinson on the nature and cure of gout. The celebrated Horace Walpole had gout at twenty-five—not hereditary in his case, for his father drank ale and had no gout. He was an ale, not a wine bibber—it affected his hands and feet; chalky concretions were discharged once or twice a year. He facetiously observed to a friend, he believed he must set up an inn, for he could chalk up a score with more ease than any man in England. In some instances these deposits on the parts are followed by destruction of the capsular

ligaments and cartilages of the joints—ulcers and mortification follow; but most usually it ends in resolution by the natural evacuations of the system, at the same time, that by abstinence, (the consequence of the loss of appetite,) the supply of the blood-vessels is fortunately cut off. Sometimes, too, the anasarca which follows, especially in feeble old age, is rendered permanent from loss of tone in the blood-vessels and absorbents, although in the first instance, it was the effect of effusion from increased action of the arterial and exhalent vessels. Ascites has also, in some cases, been the consequence of gout in very full habits, and in advanced life, especially if evacuations be not early attended to, before effusion has taken place. In some cases, too, from a diseased liver, the effect of the same fulness of system.

Writers usually divide gout into a number of species. Musgrave makes almost as many species of gout, as there are diseases to be associated with it; he has his regular and anomalous, fixed and wandering, manifest and obscure, febrile and that which is unconnected with fever. I know but one—for at the bed-side I see but one. I grant, as far as the general state of the constitution is concerned, that it is very much of a Proteus, exhibiting itself in various shapes, sometimes affecting one part of the system, at others a different: in one habit of body, we know it attacks the foot, in another, the stomach, in a third, the lungs, in a fourth, the brain; but these can only be considered as varieties, not species. Such Sauvages considered them. But Dr. Cullen divides gout into four species. In a note upon this subject, in his Nosology, he questions his own correctness in making the distinctions he has introduced. "*Me ubique accuratum fore non spondeo.*" (p. 127, vol. ii.) His first he denominates regular gout, which is attended with a violent inflammation of the joints, continuing several days, and terminating in swelling, itching, desquamation of the part affected, and sometimes a permanent anasarca. 2d. Atonic gout, characterized by debility of the stomach, or of some other internal part, and is either without the expected or usual inflammation of the joints, or is attended with slight fugacious pains or intimations in them; but is, more especially, attended with dyspepsia or other symptoms of debility, and oftentimes the irritations of the joints, and the disturbance of the digestive organs, alternating with each other. In some instances this atonic gout shows itself, not in the feet, nor in the stomach,

but in the brain. The late Mr. R., of this city, was subject to gout; but instead of his regular fits returning in the extremities, the apoplexy was his disease, and which proved fatal to him, notwithstanding the use of the lancet: whether he was bled freely or not, I know not, or whether a rupture of the vessels of the brain may have taken place is doubtful. The third species of Dr. Cullen is his retrograde gout, which first appears in the joints, and then, by metastasis, suddenly disappears, followed by affections of the stomach, or some other internal parts: this, however, is certainly but a modification of the atonic, for this is its character, that instead of the extremities, the fulness of habit and excitement fall upon some other part. His fourth he denominates wandering gout, aberrans, i. e. affecting some internal part, and is in some cases accompanied with some affection of the joints—in others, not; that is, the patient experiences some irritation from the fulness of his system, but which he has not vigour enough in his small vessels to direct to his extremities, but which confines its effects to the larger vessels, and those parts less distant from the heart. Here then Dr. Cullen makes another distinction without a real difference. This very enumeration bespeaks them to be all mere varieties of the same affection of the general system, influenced by temperament or constitution. In the sanguine temperament we see regular gout; in the nervous or melancholic, we find the stomach, and not the extremities, the seat of irritation, with all the symptoms of dyspepsia, visceral obstructions, and hypochondriasis connected with it; and in the advanced period of life, when venous plethora predominates, it affects the brain, or perhaps fortunately vents itself by hemorrhoidal discharges; but let us not commit the error of denominating phrenitis or hemorrhoids, gout. Gout is generally said to arise from a peculiar condition of the circulating fluids. This I believe to be true; but I also believe that this condition does not consist so much in any peculiar vice, as in the quantity and viscosity of those fluids. I grant the quality becomes changed; but this change I believe to be the consequence of the quantity, and the want of due discharges, by the natural outlets of the system. Let us then be careful not to mistake the effect for the cause. But, say they, we observe a peculiar matter deposited in the joints. Granted; the chemists, too, have analysed it. Mr. Woollaston tells you it is made up of the lithic acid, in union with soda or with lime, con-

stituting the lithiate of soda or the lithiate of lime. Dr. Pearson, in the same year, finding the same acid in urinary concretions, having examined upwards of three hundred calculi, proposed thence to call it the uric acid; this salt, therefore, now receives the appellation of the urate of soda or the urate of lime. But remember all urinary concretions are not made up of these two ingredients only; on the contrary, you get various combinations, as appears by Mr. Woollaston's analysis, and others, viz: uric acid, urate of ammonia, phosphate of lime, phosphate of ammonia and magnesia, oxalate of lime or mulberry calculus, besides silex and animal matter. But by consulting Wilson on Gravel and Dyspepsia, you will learn that the skin, the stomach, the intestines, even the salivary glands and the lungs, as well as the kidneys, pour out more or less of the lithic or uric acid. The presence of this acid may be readily tested by litmus paper turning red. We also see the same combination that constitutes the gouty concretions, deposited in various parts of the body, in the brain, even loading the pineal gland. In the urinary discharge, in health and in disease, after pleurisy, rheumatism, gout, and various other diseases of the class of phlegmasiæ, and occurring in the full habit of body, we see the lateritious sediment, the brick dust, vermilion-like matter lining the urinal. Are not these all ascribable to a plethoric state of body, and an inflammatory diathesis, chiefly occurring in the sanguine temperament? In other words, a redundant state of the fluids occasioning such deposits—some more than others; some thereby more predisposed to these various inflammatory affections than others; and does not this sanguine plethoric habit of body account for the hereditary character of the disease; the hereditary affections of the stomach, liver, lungs, &c.; the hereditary gravel and stone, so frequently the associate of gout? In a word, that an overloaded state of the blood-vessels, influenced by temperament and mode of life, creates these various affections denominated arthritic.

LECTURE LIX.

CAUSES OF GOUT.

THE predisposing causes of gout are—1st. The sanguine temperament. Hence it appears more in some families than others. 2d. A plethoric habit of body. Hence you find full feeding and wine drinking so intimately connected with the production of this disease. Hence, too, it is more usually the disease of males than females. It is indeed proverbial, that women and eunuchs are rarely affected by gout. Women escape, owing to the temperate mode of life which they usually observe; and when women are the subjects of gout it is usually after the natural cessation of the menses: if before, they usually acquire it by their mode of living; but even after the natural cessation of the menses has taken place, it rarely appears without the aid of the bottle, and too free use of the more potent stimuli of the table. Hippocrates, even in his day, observes, that women seldom have the gout, and never before the disappearance of the catamenia; but among the Roman ladies we find it a disease of frequent occurrence; and which Seneca ascribes to their luxurious living, and the debaucheries in which they indulged without control. (95th Epistle.) Hence, too, it happens, that the full habits which are liable to gout, when the vigour of the small vessels diminish, are also apt to end in apoplexy or palsy, or in diseases of the liver, or in dropsical affections upon the chest or in the abdomen, or sternalgia, and other affections of the heart and larger vessels; sometimes creating deposits of the earthy materials of the blood in the valves of the heart. The ventricles, therefore, fail to empty themselves; an enlargement, interruption of the circula-

tion, and serous effusions are the consequences. Hence, too, it has sometimes fallen upon the lungs themselves, and destroyed the patient by tubercles, and other evidences of inflammation of those organs.

Dr. Cullen and others have concurred in the observation, that the Portland powder, (which chiefly consists of bitters; viz. gentian, at least this is its most active ingredient,) which was celebrated for the prevention of gout; when persisted in for any length of time, produced apoplexy, palsy, asthma and dropsy. But there is no mystery as to the production of those diseases without that auxiliary. Looking at the habits attacked, and the causes operating, the mystery vanishes.

Dr. Darwin, too, ascribes to the hop, and other bitters, made use of in beer, what is in part due to the beer itself, in the production of apoplexy and affections of the liver. But not only natural fulness of the habit predisposes to this disease, but the acquired fulness and excitement occasioned by full living. The excessive use of wine, porter, animal food, the condiments of the table, predispose to this disease; and, indeed, of themselves, I believe, in some instances, excite it. It is not necessary to descend from titled parents to get the gout. Some persons, without any other patrimony than a sanguine temperament, and a good constitution, acquire this disease by their own intemperance, or free living. An elderly gentleman in this city, whose predecessors cannot boast of their coat of arms, but who had never known of this disease in the family before, acquired this complaint by his mode of living. His first attack took place in advanced life, from want of exercise, and the free use, not of wine, but of spirituous liquors, and of animal food. He had regular paroxysms annually, and sometimes semi-annually. It is not, therefore, necessarily an hereditary complaint. In some instances, I have remarked, it appears early in life; i. e. where early dissipation is indulged; but most usually it occurs at an advanced period of life, which proves another predisposing cause of gout, by the debility that takes place in the extreme vessels, and the diminished excretions, the consequences of that debility. Hence it is that debility of various sorts, and especially that of excess—in wine, in women, and the indulgence of the passions, is the parent of this complaint. Hence the adage—

"Bacchus pater,
Venus mater,
Et Ira obstetrix arthritidis."

For in that state of debility, those organs, the usual seat of that disease, are most irritable, and inflammation follows. A previous attack also, in a peculiar manner, predisposes to a second, by the debility induced, as the parts once the seat of sore throat, of pleurisy, rheumatism, erysipelas, or other inflammatory diseases. So gout is easily renewed by change of weather, of season, or other exciting causes. The more variable seasons of the year, too, are to be enumerated among the predisposing causes of this disease, as the spring and autumn; but, like the rheumatism, it is not so frequently a disease of the winter as of spring and fall; except when the weather is unusually variable; and in summer it is very rarely met with. On the contrary, this is a season of perspiration, and of depletion, instead of eating and drinking; for in summer the appetite is fortunately impaired, especially for animal food; and vegetables and fruits are less exciting to the system than animal food, and at that season constitute the largest proportion of our aliment. It is also a season of exercise, which usually also secures the subject of gout at that season. Our gouty gentlemen then usually have recourse to a journey, or they resort to our watering places, to Rockaway, Long Branch, and Ballston, to dilute their wine by water, and restore themselves after their winter's campaign. They go away for health; but by their mode of living, they bring back great pabulum for the disease.

In like manner many other diseases that appear in the more changeable seasons, rarely take place in summer, as most of the phlegmesia; the cutanei, and other diseases, as apoplexy, palsy, and other of the neuroses, connected with fulness of the brain, as mania and hypochondriasis, but which are frequently ascribed to debility, the effect of cold!! whereas they proceed from the plethora attendant on winter, in which our excretions are diminished, and our ingesta increased—in which our income exceeds our outgoings. Thus it is that we see gout counteracted by the climate. In Champaign and Burgundy this disease is scarcely known, yet it is well known too that they drink freely of wine, especially the lighter wines, and wines too abounding in acidity. This effect of a warm climate, probably by its operation upon the excretions, especially by the skin, accounts for the prevalence of

the disease in one climate, or country, while another is exempt; hence the remark of Lucretius, "Gout clogs the feet in Attica; the sight fails in Achaia." In like manner, in China,* the gout is scarcely known; while in the variable climate of Great Britain it is readily induced by the application of the ordinary existing causes. It is frequently said, that persons who are remarkable for a plentiful perspiration generally escape the gout, although they may indulge in an abundance of wine, and the other good things of the table. A gentleman in this city, who has always, through a long life, fared sumptuously every day, is a remarkable instance of this exemption from gout, altogether attributable to exercise and a constant current from the surface. But again, the inhabitants of the Feroe Islands, who live by fishing, though they drink no wine, yet in consequence of their alternate exposure to cold and wet clothing, and their hot drying rooms, together with spirituous drink, are the subjects of gout: so says Landt, in his description of the Feroe Islands. Here, then, is an exception to the general remark, that gout is a disease of the rich and the indolent. Here the labouring poor are also the sufferers from this complaint.

THE EXCITING CAUSES

Are, 1. cold, especially combined with moisture. In the case of Mr. H. it was thus first induced, having been thus exposed four days and nights in an open boat, at the Cape of Good Hope. None of his family before him had experienced this disease, yet I never saw a more regularly formed disease, or more uniform in its returns than in that gentleman. He is now in a warm climate, and perhaps enjoys an exemption from his ordinary visitations. His son states that he has been sensibly benefitted by change of climate. 2. A debauch, especially the excessive use of wine and ardent spirits. Porter drinking, by loading the vessels, and being less stimulant, does not so readily beget gout as wine and ardent spirits; on the contrary, it most usually ends in diseases of the liver, or in the production of dropsy, apoplexy, or palsy. It requires the more potent diffusible stimulant of wine, and a vigorous state of the system, to carry on an uninterrupted stream, the disease, to the feet. Porter and malt liquors in general are more apt to bolt from the course, or rather to halt by the

* Le Conte, see Good, vol. ii. p. 507.

way, filling the larger vessels of the head, the chest, or the viscera of the belly. Van Swieten accordingly remarks that when the people of Holland drank malt liquors, gout was scarcely known; but he adds, that this disease has become very common among the Dutchmen since the introduction and more free use of wine. Cadogan also observes, that he had been assured by a physician who practised above thirty years in Turkey, that from the Danube to the Euphrates he had never seen a gouty Turk; but the courtiers, it appears, were not as good Mahometans; they drank wine, gout was their disease. The same physician, Cadogan, states, that he has been credibly informed that the Gentoos, the simplicity of whose fare is proverbial, know not this disease, so exclusively does it arise from diet and luxurious living. 3. Indigestion, from quantity or quality, is also among the exciting causes of gout; hence, bad wine, punch, lemonade, small beer, some particular article of diet too much or too little done, are sure to be noticed by the *bon vivant*, as the exciting cause of his complaint. It is true that a little thing will light the flame; will kindle a fever in this combustible state of body. 4. Violent exercise. 5. An injury done to the foot or to the joints, the usual seat of the disease, will, in some cases, renew the paroxysm by the inflammation induced. The pressure of a tight shoe or a boot has been known to induce it; thus too, an injury of the knee has made that the seat of attack, when it previously appeared in the foot. Mr. C——r had the disease ordinarily in the feet, but injuring the knee, his disease for some time uniformly fastened itself there. In 1816, he took a long journey through the north western parts of this state, and escaped his usual attack in that and the next succeeding year. He afterwards became the subject of apoplexy, and after two or three attacks died suddenly.

The proximate cause of this disease, agreeably to the facts that have been adduced, appears to consist in an active unmixed inflammation of the part or parts affected. To convey my idea of the disease, I call it rheumatism in the small joints, and rheumatism gout in the larger joints and muscles. All the predisposing and exciting causes of this disease bespeak its nature. It is not then an hereditary disease, except so far as the peculiar temperament or constitution, and the mode of life may render it so. Indeed, were it an hereditary disease, we should not so frequently see it engendered in the individual whose ancestors on both sides

have lived to a great age without a symptom of it. Another consequence would be inevitable—females as well as males would be its unavoidable subjects—not so is the fact; they have a predisposition in the sanguine temperament, and a good constitution; but let them avoid the usual exciting causes of the table, and take regular and daily exercise, they escape the disease.

TREATMENT.

The cure of this disease does not consist merely in patience and flannel, as recommended by Dr. Cullen and others. True it is, they go together, for the more flannel the more patience is certainly necessary, to bear the additional sufferings which great accumulation of heat produces in the part the seat of inflammation. Dr. Thomas, too, has tamely copied Dr. Cullen on this subject. Nor shall I recommend the contrary practice of applying cold water to the limb the seat of the disease, as was the practice of the ancients, and which has lately been received by Dr. Kinglake and others, and by Dr. Good! Hippocrates, *Ætius*, and Celsus, advise this practice. That they should not have formed a correct view of the nature of this disease, is not surprising, as they could not have known the nature of the fluids of the system, and the changes induced in the nature of the excretions. Besides, gout at that day was a disease of rare occurrence, compared with its present prevalence, especially since the great discoveries and improvements which have been made in kitchen chemistry, or the science of gastronomy, as the savans of France denominate it. To our great surprise, we find the same practice recommended by Harvey. He immersed his own feet in cold water at the approach of a fit of gout, and fortunately escaped the evil consequences of the application, and lived to the age of eighty. Van Swieten, too, relates the case of an officer of the infantry, who rubbed his feet with snow and walked barefooted on the snow, in the commencement of the gout, and with success. See also Rigby on animal heat. (*Med. Obs.* vol. 6.) Most of those whom I have known to follow this practice, have either died of apoplexy, or have become affected by other diseases more dangerous in their nature and consequences than the original disease of gout. The late Dr. Joseph Brown, of this city, pursued the practice of immersing his feet in cold water, at the

approach of every fit of gout. He is since dead of apoplexy. As in the indiscriminate application of cold water in febrile diseases, a man knows little of the condition of body existing either in gout or fever, or of the powers or functions of the system by which they are to be removed; who can thus depend exclusively upon the application of cold—who, in other words, can consider gout and fever as consisting merely in a high temperature of the system, or of a particular part? On the contrary, this remedy is to be made use of very cautiously, for the reason before assigned, lest some other part of the system should become the seat of irritation, as the brain, the stomach, the lungs, the liver, or the heart.

By the application of cold to the part, you may relieve the local irritation; but the patient is only relieved to be attacked in a more formidable manner. You dam up the fluids in one direction, but they overflow in another. Tepid applications are in such cases to be preferred, and they certainly afford the same relief without the danger to be apprehended from cold. Nor shall I recommend to you an exclusive dependence upon the late celebrated remedy which has been received within a few years: "the Eau Médicinal d' Husson," though it is considered a remedy of great value. But I believe, indiscriminately as it has been prescribed, it is rather more valuable to the physician than to the patient. But as it operates as a cathartic, diuretic, and sudorific, it may certainly be useful in slighter attacks of the disease, and thus be found a valuable auxiliary in the cure of gout. I have already told you, that most physicians consider this medicine to be made of the *colchicum autumnale*; some, again, consider it as prepared from the *rhododendron chrysanthemum*.

The indication, which appears to me to arise out of the view we have taken, will be to divert the action from the part, by diminishing the volume of fluids, and thereby diminishing the momentum and activity of the circulation; and by restoring the natural excretions of the system. If arising from plethora and inflammation, these cannot fail to afford relief. And if they arise from any particular morbid material, or vice, of the system, we cannot possibly adopt a safer mode of practice than by opening the various excretions by which the enemy may find an outlet. It will at least lessen the febrile state of body, which such irritating material within may create. But my own belief is, that gout is a simple inflammatory disease, in the smaller

joints, analogous to rheumatism in the larger, only influenced by the habit of body in which it occurs, and the causes exciting it. But inasmuch as it arises in a particular habit of body, and is produced by a different exciting, as well as, in some respects, different predisposing causes, so it exhibits some peculiarities which are not usually found in rheumatism. But in many other respects the two diseases are the same.

Gout arises from internal causes—rheumatism from external. The external causes being continually applied, the disease is accordingly removed. Not so with rheumatism, which is generally the effect of cold. It therefore has not its regular returns, like gout. But the same exciting cause; viz. cold, will produce gout in one habit of body—rheumatism in the other; and can, therefore, only be distinguished by a reference to their causes, and the constitution, time, and modes of life.

My treatment corresponds with this view. Venesection, accordingly stands at the head of the list, as in other diseases of inflammation, and should be employed in proportion to the violence of the disease, and its duration; but with caution in the last stage, as in other inflammatory diseases; taking into view, at the same time, the age, habit, and debility of the patient; not forgetting the question of Celsus, "*Quæ vires sint?*" This, I know, is a heresy; but we have highly respectable authorities in support of this practice. Sydenham, Huxham, Cullen, Musgrave, Dr. Robert Hamilton of Lynn, (Eng.) and Dr. Rush, have all recommended it. Hamilton employed it eighteen years upon himself and others, without ever producing any retrocession of the disease to other parts of the body. This is the best mode of saving the other organs from injury. Nor was Musgrave satisfied with general blood-letting. He made use of, and advised cupping, scarifying and leeches. These, too, I consider well calculated to diminish the local inflammation attendant on this disease. Dr. Cullen recommends them also, when the inflammation is uncommonly violent. Do not wait for this violence before you employ these means of diminishing inflammatory action, when it has commenced.

2d. Some writers recommend emetics in this disease. In the sixth volume of the Lond. Obs. and Enquiries, you will find Dr. Small's account of their use, in his own case. He states that he employed them with decided effect. Dr. Pye also recommends

them in this disease. Without previous blood-letting, especially in persons of full habit, and who are consequently liable to apoplexy, they are certainly dangerous in their operation. And as the stomach is the irritable and weak part in gouty habits, I should hesitate exceedingly to administer emetics in the manner they advise. Occasionally the stomach is in that condition that may require the operation of an emetic to cleanse it. In that case, a mild emetic may be administered.

3d. Cathartics are indicated. But as the patient is more or less dyspeptic, let them be such as are not very debilitating, especially if the patient be advanced in life. Rhubarb and vitriolated tartar to the quantity of \mathfrak{zss} . each; or rhubarb, \mathfrak{z} i.; magnesia, \mathfrak{z} i.; and mint-water, \mathfrak{z} iiij, are among the best means to be directed with this intention.

Saline purges are generally too cold and debilitating to the stomach, and renders that organ still more irritable, and hence may produce spasms of that viscus, called *gout* in the stomach, and which sometimes ends in inflammation. The Cheltenham salts, and Cheltenham waters, are considered exceptions to this observation. According to Jameson's analysis they consist of the sulphate of soda, the sulphate of magnesia, with the carbonate of lime and a portion of iron. They are accordingly found not to debilitate as the ordinary saline purges, at the same time that they are equally useful in removing visceral obstructions, as those of the liver. On these accounts they are very much resorted to in gouty habits. Sydenham's caution as to the debilitating effects of strong purges in this disease is certainly just; but, like the satyr in the fable, he blows hot and cold at the same time; for, according to his principle you would not give them at all, strong or weak; for he tells you that purges in the beginning of the disease are injurious, inasmuch as they prevent the matter of gout from fixing itself upon the foot; and again, that they are injurious in the last stage, after a fit is over, by bringing it back again into the feet. Theory, certainly not practice, influences Sydenham on this subject. His observations are, however, just, as it regards the effects of very debilitating cathartics. Those I have referred to are assuredly beneficial in the commencement of gout. Hoffman himself had recourse to a purgative, before or in the commencement of the fit of gout, and he tells you with great benefit. A late writer, probably Dr. Bateman, (see Rees's Cyclo-

pædia,) also states that he has known the fit of gout to be prevented by taking a brisk purgative, viz. fifteen grains of scammony, when the first symptoms appeared, making a smart counter current. Van Swieten is also in favour of cathartics in this disease. Dr. Rush is also the advocate of this practice. I have frequently also, in the case of the late G. C. of this city, parried his fit of gout by means of rhubarb, magnesia, and mint water. 3d. Attend to the skin; but let it be relaxed by such means as will at the same time diminish excitement, viz. by the sp. mind. and laud.; by Dover's power; antimonial wine and laudanum, aided by tepid drinks; and if the stomach be weak, by herb teas, as catnip and mint, or weak wine whey, otherwise great caution is necessary in the use of wine. The spirituous steam bath is recommended by Blyborough, in his communication on gout, (see Med. and Phys. Journal, vol. xii. p. 62.) It was a few years ago introduced into this city, and was employed by Gen. B. In his case it was made use of before venesection. It manifestly aggravated his sufferings, and produced all the symptoms of approaching apoplexy, and which blood-letting alone prevented. Another gentleman also made use of it, and with an evident increase of his disease; but a tepid bath, tepid fomentations, a cotton poultice, I mean a light covering of carded cotton, or flannel, for the purpose of promoting perspiration, and preserving an uniform temperature, are doubtless proper; whereas the immense loads of clothing, either to the limb or to the whole body, which are usually directed, are no less pernicious.

4th. Some physicians recommend blisters. Dr. Chalmers used them in his own case. Dr. Rush also bears testimony to their use, and the relief they afford.

5th. The sufferings of the patient are also to be lessened by opium; that is, after evacuations have been made from the whole system, otherwise the consequences noticed by Caverhill may be looked for, viz. apoplexy or palsy, especially, he observes, in the aged; not so after venesection. Dr. Cullen does not appear to be aware of these dangers from opium; but its effects, in diminishing the circulation in the smaller vessels, and in filling the larger, are not to be questioned after the experiments of Dr. Monro. After blood-letting one of the best forms of administering opium; and indeed, generally, when you wish to diminish pain and to relax the skin, is in the form of Dover's powder, or

in combination with camphor, or the celebrated drops of Dr. Friend, viz. camphorated spirits two parts, laudanum one part, a teaspoonful every two or three hours. Dr. Charlton found them to be exceedingly friendly in his case.

6th. The tincture of colchicum has lately been administered with great success in this disease; its sensible effects upon the stomach, bowels, and skin, as well as its anodyne operation upon the nervous system, certainly recommend it to our confidence as an auxiliary in the treatment of gout. A strong saturated tincture of hops may also be useful in the same manner.

7th. A connexion existing between gout and nephritis, has induced some physicians to recommend alkalis and magnesia, as a specific to counteract the uric acid; but they are neither to be depended upon, as those urates are deposited as the effects of fullness and excitement, by the removal of which alone, the cure of the disease is to be effected. They are no doubt palliatives in gout, by correcting the fermentation attendant on the deranged state of the digestive organs; and in nephritic affections they doubtless may be, and probably are useful in correcting, and perhaps by decomposing the saline materials, the effect of such plethora. They may in like manner, correct the general lithiasis of the system, frequently accompanying the gouty habit of body.

The diet in the first stage, should be simple and strictly antiphlogistic; toast water, herb teas, soups, vegetables, roasted apples, light puddings. The regimen, in the first stage, should particularly have reference to the temperature of the room, drinks, and baths. Quiet should also be enjoined. Let the patient also be directed to abstain from business and company, for friends now usually come with their congratulations, forsooth that the man is not to die of an apoplexy, and that he has his inflammation at the other end of the body; they profess to give him joy of his gout; but they materially add to his distress and sufferings. It is, I believe, not to be doubted that the gout, like some other diseases, wastes its irritation on the extremities that would otherwise vent its force upon an internal or a vital organ. So far it may be considered as comparatively a salutary disease.

SECOND STAGE.

This is evinced not only by manifest general debility, and perhaps emaciation, but also by anasarcaous swellings; or perhaps,

ascites, with diminished urine. Tonics and stimulants, general and local, are now indicated at the same time that those means are to be preferred which have most effect in restoring the suppressed excretions. For these purposes—1. Bitters, viz: the infusion of columbo; gentian with soda and rhubarb. 2. Iron in its various forms of filings with ginger, or extract of gentian, or rust with do. or canalla alba, or Ballston waters. This has been found like the Cheltenham waters, very beneficial. 3. Diuretics, viz: horse-radish, parsley roots, mustard seed, &c.; or the diuretic decoction of the seneka snake-root, and juniper berries. 4. Sudorific stimulants, as tinct. guaiac. simp. or volatile. 5. Local stimulants, bandage and the flannel roller, liniments, turpentine, &c., except eruptions or ulcers exist, yeast may be required, pickled flannels, flour of mustard.

DIET.

Gradual return to animal food, wine also—a hair of the same dog will be necessary and proper—the condiments of the table, too, now are useful, especially mustard, salt, horse-radish, and cayenne pepper.

REGIMEN.

Exercise in the open air, to the sea-shore, in a carriage at first, afterwards on horse-back; friction with the flesh-brush, or the hands, not forgetting the spirituous liniments, and Dr. Balfour's flannel roller, while the limb is relaxed or swelled, or pits on pressure.

So much for legitimate gout. But should the disease suddenly disappear from the feet in its commencement, and while the system is under great general excitement, it should invade the stomach whether this organ be the seat of irritation from a dyspeptic state of it or from a loaded state of the liver, what is now to be done?

I am speaking of the first stage of gout, when it is first displaying itself, and the customary fit of it has been expected. In such case the pain in the stomach soon ends in gastritis, and proves fatal, unless vigorous treatment be pursued. Venesection is now

necessary, and remember to bleed freely, or your patient will die, and you will be charged with killing him; for a small bleeding will do him no good, and you will in that case be censured for bleeding him at all; therefore, do it as it ought to be done in any other of the phlegmasiæ; fortunately too it is one of the best antispasmodics you can prescribe. The bowels should be relieved by injections, and opiates may be administered freely, especially the Dover's powder. If, however, you have reason to consider the attack more of a spasmodic than an inflammatory nature, laudanum and mint-water will be preferable, and should be administered in large quantities. Fomentations to the stomach, viz: with mint and brandy, and those applied as hot as the patient can bear them, he being free from fever, are also proper in these irritations of that organ. Blisters, immersing the feet in warm water, adding spirits to the bath, friction with mustard, covering the part with flannel, frequently invite excitement there, and, by metastasis, remove the irritations of the stomach. Spiced wine, æther, hot toddy, are also valuable auxiliaries with this view. As to the effects of gout affecting the brain, it then assumes a new character, that of apoplexy, and is to be treated accordingly. One word upon the preventives of gout. As the causes of this disease are for the most part intemperance and indolence, so the best means of preventing its return may be summed up in their immediate antidotes, temperance and exercise, i. e. temperance in eating and drinking, not only as to quantity but quality. Instead of wine, spirits, porter, ale, or other fermented liquors, water should become the beverage of the sufferer from gout; he, at least, should take moderately of wine. Remember the anecdote of Marmontel. He had been much subject to head-ache and giddiness of head, the common consequences of a sedentary life and full feeding; his farrier went into his room during one of those attacks, and who appears to have known the nature of his disease much better than his physician. The farrier was satisfied that Marmontel's complaint proceeded from fulness of his vessels, and the viscosity of his blood. Marmontel asked John what he should do to relieve them. The farrier in return asked Marmontel, who was at his writing-desk, Sir, suppose your ink was so thick that it would not flow easily from your pen, what would you do? I would add water, says Marmontel. Do the same, sir, with your blood. Marmontel took the hint, and profited by John's prescription. A patient of mine,

who has suffered many severe attacks of the gout, by means of dilution, and abstinence from his customary quantity of wine, and the occasional use of the elixir proprietatis, keeping his digestive organs in good order, has escaped the disease for many years. I do not, however, approve of the rigid abstinence enjoined by Cadogan—this is not necessary; temperance in all things should be the motto of the patient liable to gout; but to proceed from one extreme to the other is only calculated to relax the body, and fill the vessels, and thence, if not to beget gout, it is likely to produce some of its associate or vicarious diseases, as apoplexy or palsy; for where persons have been long in the habit of using powerful stimulants, sudden abstinence is apt to induce dyspepsia, with a general irritability of fibre, and greater liability to inflammation from cold, &c., and in some cases, venous plethora, showing itself in an apoplexy, palsy, or a diseased liver, and dropsy has been the consequence of such system of abstinence. Exercise is no less necessary to secure the system against that fulness of habit and excitement constituting gout. The late Dr. James Gregory was an example in whom the gout, though the predisposition was hereditary, was banished by abstinence and exercise. He, too, in early life, had suffered severe attacks of that disease. Exercise may be taken on foot or horseback; gestation in a carriage, or by sailing, is not sufficient. Friction by the flesh brush also contributes to an equal distribution of the fluids, and the healthy excretions connected with it. Suitable occupation of the mind, in pleasure and business, is no less conducive to health. Dr. Gregory, in the winter of 1792-3, informed me that, with all his family predisposition to the gout, and, as he supposed, both on the father's and mother's side, he had at that time prevented it for about sixteen years, by exercise; not yet having much to do in his profession, he walked out to Musselborough, a town about five miles from Edinburgh. This was not afterwards necessary, for his practice became so extensive, that he necessarily led a very active life; not so in 1792-3, when he stated to me this fact. But Dr. Gregory not only took exercise, he also abstained from wine, and was moderate in the use of animal food; by these means he had escaped the gout upwards of thirty years, though in early life, in the hey-day of youth and its pleasures, he had suffered from it. A strong evidence of the good effects of temperance and exercise. Cadogan had four fits in his younger days, but, by temperance,

was perfectly freed from it. Dr. Heberden states similar effects of abstinence from wine, and the moderate use of animal food.

The excessive indulgence of the passions should be no less guarded against. While Bacchus and Venus are considered as the more immediate parents of gout, remember "Ira," which stands for the passions in general, is put down as the "obstetrix arthritidis"—the more immediate agent that brings gout into life. Celsus also states that some persons, by abstaining a whole year from wine, and venery, have obtained a security from gout the remainder of their lives.

The warm bath I also consider, by its effects upon the surface of the body and the secretions in general, among the most effectual means of prevention. Hence the French are comparatively free from gout, though they are celebrated for the stone and the pox. So far, then, we may say to our patient on this subject, in the language of St. Evremond—"Quod petis in te est." Therein the patient must administer to himself. But when this temperance and exercise cannot be carried into operation, an occasional bleeding—say early in the spring, before the sap rises, and early in the autumn, before the cold and other exciting causes are applied, and the season of feeding commences, may be found very useful in preventing the recurrence of the disease. This practice I have in many cases pursued with the best effects.

An occasional purgative is also useful, not only for depletion, but to guard against indigestion, usually preceding the gout, and in some instances, its exciting cause.

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ERRATA.

THE following errors of the press escaped the eye of the Editor, or occurred during his absence from the city. Some other minor errors, which the intelligent reader will discover and readily understand, are not noticed. It is believed none others of any consequence will be found in the work.

Page 50,	line 4,	for negere, read negare.
" 59,	" 1,	for progressis, read prægressis.
" 82,	" 24,	for yellow fever, read fever.
" 319,	" 23,	for absenthium, read absinthium.
" 334,	" 12,	for phlegmasia, read phlegmasia.
" 335,	" 28,	for urine, read urina.
" "	" 29,	for turbetæ, read turbatæ.
" 339,	" 11,	for contagiones, read contagiosus.
" "	" 13,	for turbetæ, read turbatæ.
" "	" 19,	for digitori que, read digitosque.
" "	" 38,	for nequequam, read nequaquam.
" 340,	" 1,	for ponere disunt, read ponendi sunt.
" "	" 29,	for typo, read typho.
" 341,	" 6,	for utricorum, read utri eorum.
" "	" 6,	for referenda, read habenda.
" "	" 14,	for free, read full.
" "	" 21,	for remittent, read excitement.
" 346,	" 16,	for having overlooked forms, read being overlooked.
" 350,	" 16,	for of want of, read want of.
" 352,	" 23,	for compounds, read confounds.
" 486,	" 1,	for PAROTIS, read PAROTITIS.



